



STATION, SILVERTON,
TELEGRAMS, BUDLAKE,
TELEPHONE, MELE 9.

KILLERTON,
EXETER.

October 1st 1927.

Dear "Teacher".

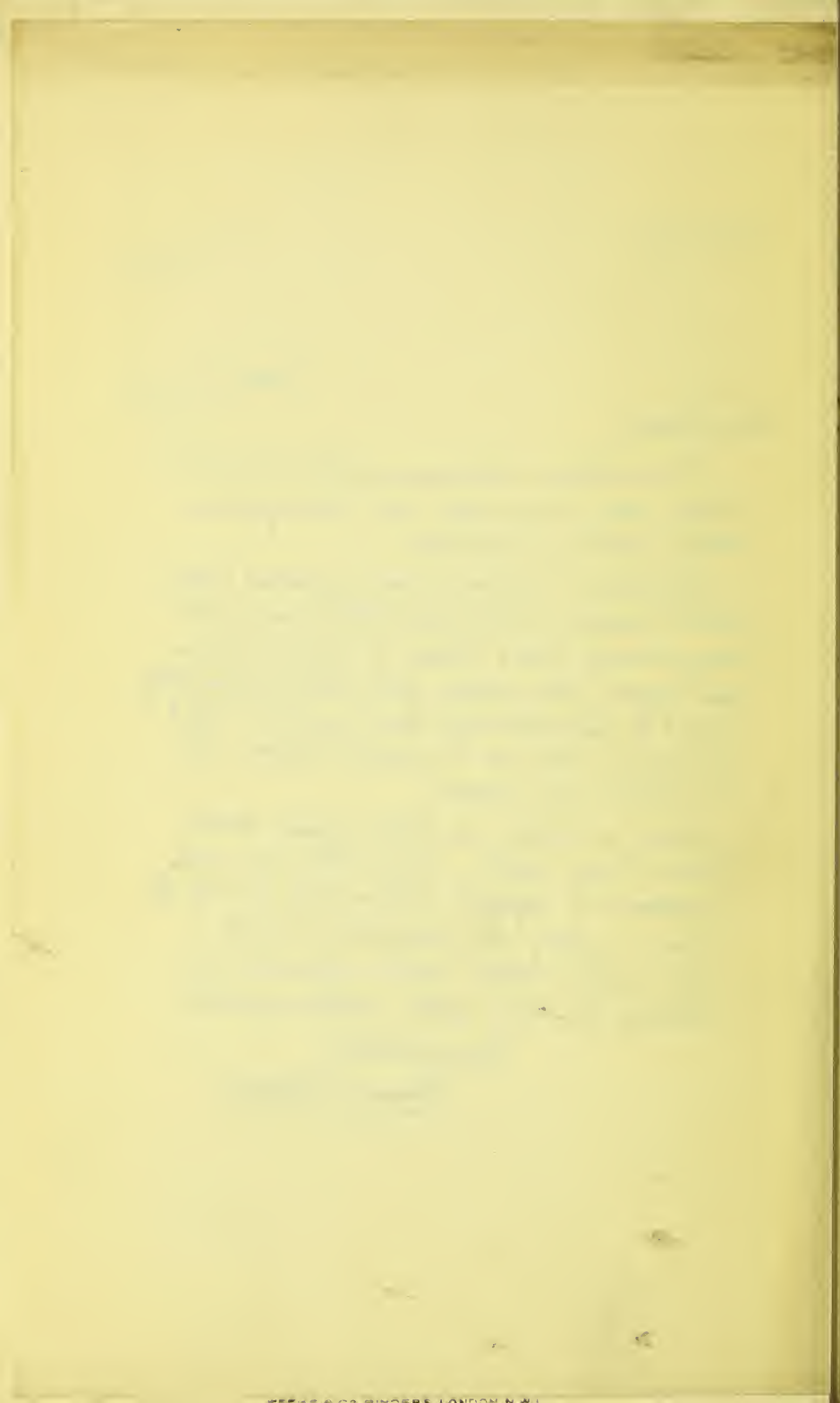
I have written an introduction to this book to explain why it was written and how important dental health is to children.

In this letter I venture to make a personal appeal, not as Chairman of the Dental Board, but as one who has himself been a teacher to comrades who, as head teachers, hold positions of the greatest responsibility, to read the book yourselves, and to enlist the help of the teachers under you to convey its lessons alike to children and parents.

You are as teachers one of the greatest Health Services of our country, and I look to you with confidence to co-operate with our other great Health Services in giving the people of our country a proper start towards health in their lives, by securing the health of their mouths and teeth.

Yours sincerely

Francis S. Acland.



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THE UNIVERSITY OF CHICAGO
185
CHICAGO, ILL. 60637
U.S.A.

FOUL BURN AGITATION!

STATEMENT

EXPLAINING THE

NATURE AND HISTORY OF THE AGRICULTURAL
IRRIGATION NEAR EDINBURGH ;

CONTAINING

A REFUTATION OF THE UNFOUNDED AND CALUMNIOUS
MISREPRESENTATIONS ON THAT SUBJECT,

IN

A PAMPHLET PUBLISHED IN NAME OF A COMMITTEE OF
POLICE, IN WHICH THE ANCIENT AND BEAUTIFUL
CAPITAL OF SCOTLAND IS FALSELY DESCRIBED
AS A RESIDENCE UNSAFE TO THE HEALTH
OF ITS INHABITANTS.



EDINBURGH:

JOHN LINDSAY & CO. ST ANDREW STREET ;
LONDON, HAMILTON, ADAMS & CO.

1840.

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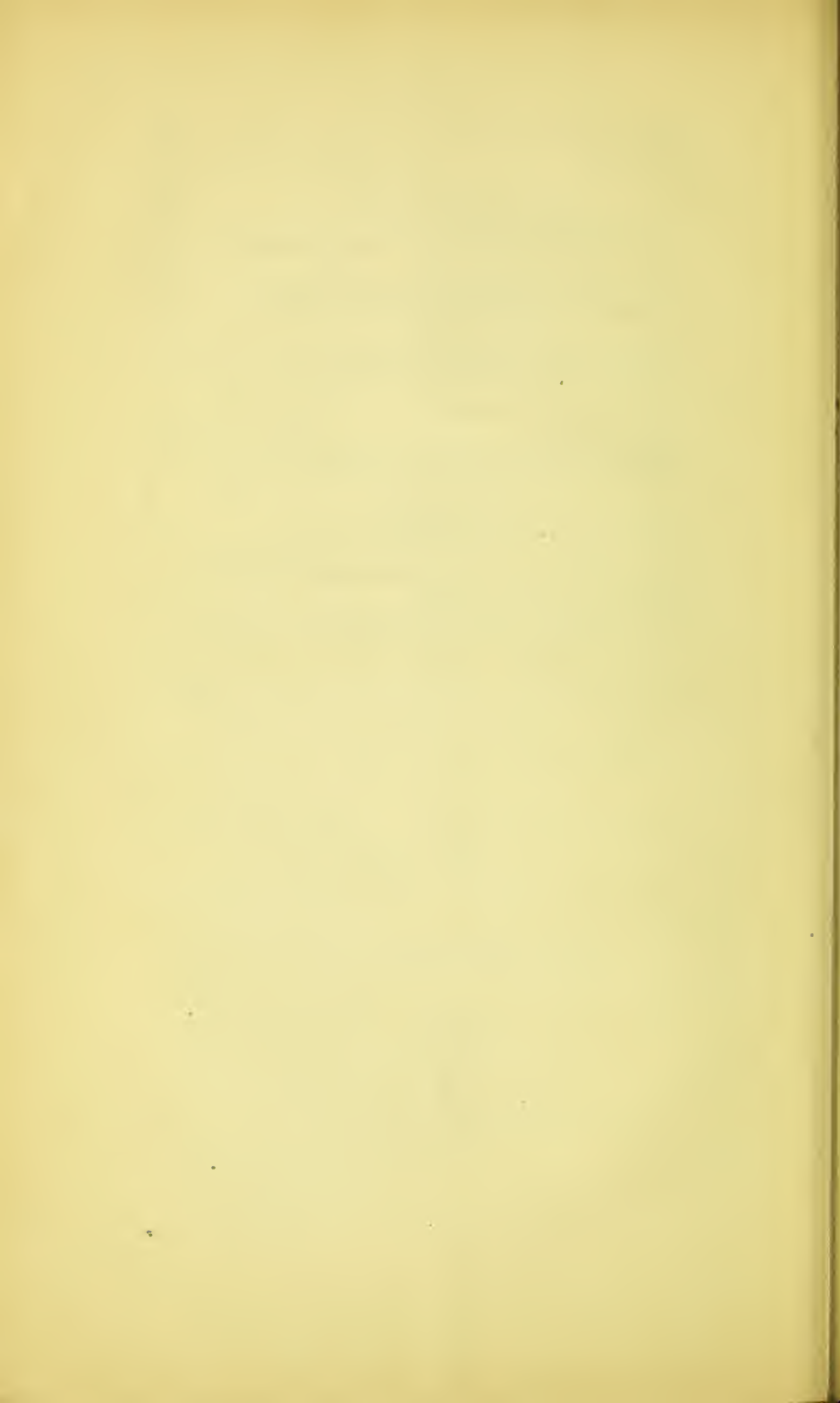
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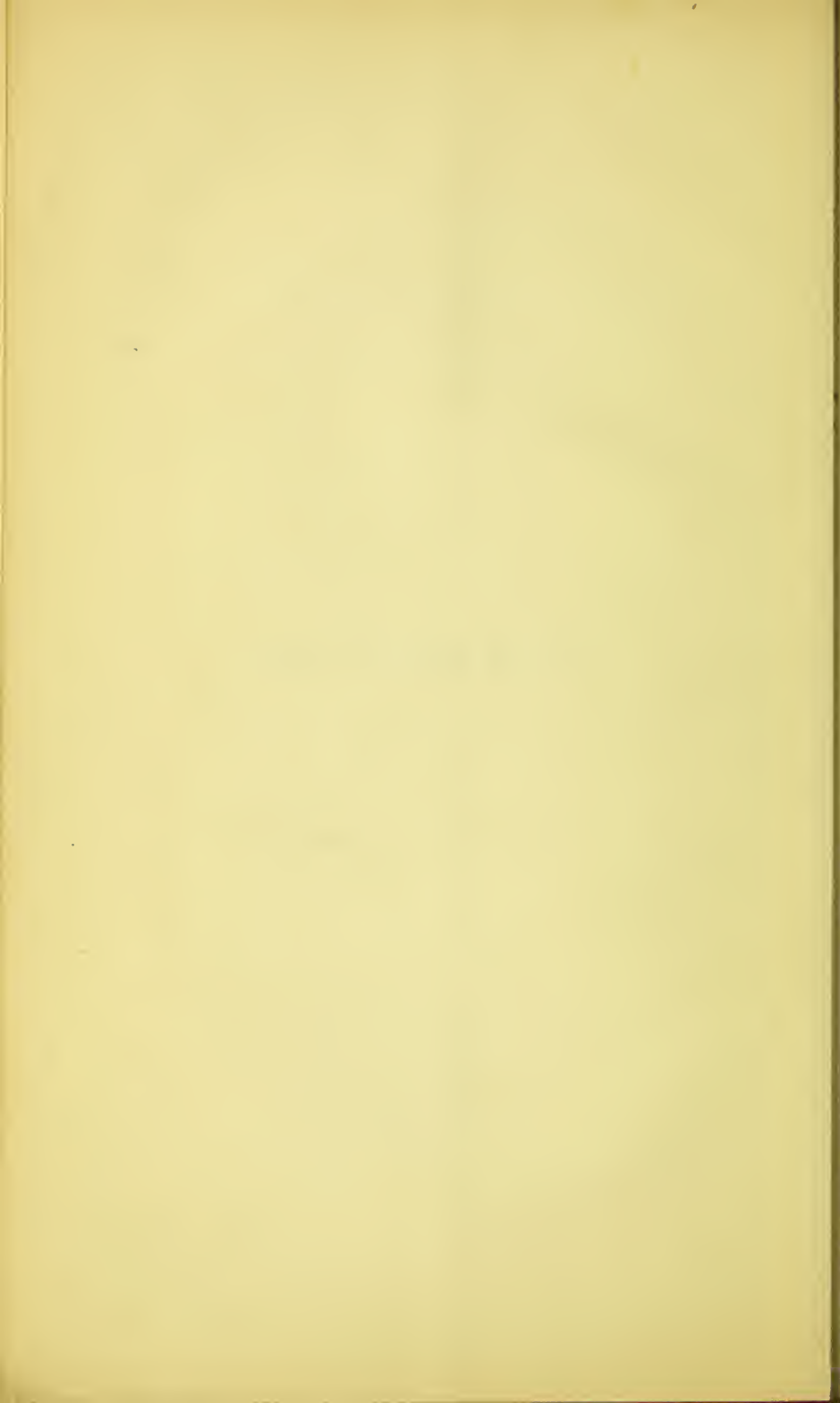
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STATEMENT, &c.



STATEMENT, &c.

Since the month of March 1839, great exertions have been made to excite in Edinburgh a popular agitation against the practice which has existed for ages, of employing in agricultural irrigation the streams of water that descend from Edinburgh to the sea. Those streams are supplied by copious natural springs that rise in the City and its vicinity, or by the water introduced from the Pentland Hills, and the abundant rains of our climate, which, descending with a rapid current, carry off all impurities from our streets, lanes, and houses. Inflammatory harangues have been made at popular meetings against the irrigation of the lands below the City. These have been industriously reported in newspapers; and letters of the same character and tendency have filled every ordinary vehicle of intelligence. No effort has been spared to stir up popular clamour. The proceedings of those representative bodies, the Town-Council and Commissioners of Police, have been interrupted, that the members might listen to harangues hostile to the improvement of the grass lands in the vicinity, as formerly, by irrigation. Speeches made in the Town-Council, and at the Police Board, have been circulated in the daily newspapers, and at length, the person put forward as the leading agitator, by much urgency, prevailed with the Commissioners of Police to impose on their constituents the expense of printing and circulating, as the report of a Committee, a pamphlet of a most extraordinary description, amounting to a reprint of the most virulent anonymous letters, and of the orations previously published against the practice of irrigation. To these are added certificates industriously obtained, not from agriculturists

who understand the subject, but mendicated from about a dozen out of the 270 members of the medical profession in Edinburgh and Leith, and from others who, from various motives, have furnished speculative opinions, founded on the representations and averments brought forward by the Chairman of the Committee of the Commissioners of Police, and his instigators or subordinate associates. These averments will presently be shewn to be either absolutely untrue, or the result of a suppression of the truth, or at best, proceeding from gross and culpable ignorance of the nature and history of the agricultural irrigation, and of the irrigated meadows, which they calumniate.

The pretext for this agitation has been the increase of fever, which has very recently occurred in Edinburgh. It is admitted, that "Edinburgh has long been famed for its salubrity as well as for its beauty. The elevated situation of the City itself has made it capable of the most effectual sewerage and drainage, and the purity of the air amid the fine scenery, and noble walks of its immediate neighbourhood, rendered it, in the words of Arnot, 'the most healthful of any town of equal bulk in Great Britain.'" (P. 7.) But it is said that this state of things has altered, that cases of fever have become more numerous of late years; and, without any authentic statement of numbers on the subject, as compared with other Scottish towns, it is asserted that Edinburgh is now to be regarded as an unsafe residence, and the evil is, without inquiry, ascribed to the irrigated lands in the vicinity. If this assertion shall be demonstrated to be utterly groundless, the community will not find it difficult to decide on the merits of those who have calumniated the capital of their native country, in relation to a matter of vital importance.

Edinburgh has of late years suffered grievous calamities, partly from national measures, and partly from the rash proceedings of its own inhabitants. By the removal of the public establishments, and concentration of the business of the revenue in the capital, men of property holding offices connected with that department, have been compelled or induced to remove to London, whereby not only their sa-

laries, but the rental of their Scottish estates, are no longer expended here. The alterations in the judicial system have produced a similar diminution of revenue expended in Edinburgh. On the other hand, the inhabitants are severely taxed to pay the debt created by the expenditure of nearly L.100,000 in alleged improvements, the chief of which, the costly road to the south of the Castle, is utterly worthless. By these, and other measures and events, Edinburgh has lost an expenditure calculated to amount to L.70,000 per annum ; while, at the same time, it labours under severe taxation. The only valuable establishment that remains to bring an income to the Town is the University, but that establishment the Chairman of the Police Committee deliberately attempts utterly to ruin, by representing the City as an unhealthy residence. The University has otherwise grievously suffered from the augmentation of the Professors' fees payable by students, and by additions made to the classes to be attended to obtain the medical degree. If higher remuneration was necessary, in order to obtain the most eminent teachers, it ought to have been afforded from the public funds of the Town ; or, if these had fallen into bankruptcy, the University ought to have been transferred to the general government of the Empire, that it might be liberally supported. The representative rulers of the City ought to have protected the inhabitants against a cumbersome course of education, held superfluous by our wiser forefathers, who knew that all that a professor can do is, not to make young men wise or learned physicians or philosophers, but to point out the path by which professional eminence and learning may be attained. In consequence of the erroneous conduct of the rulers of Edinburgh, young men are compelled to avoid this City, and to have recourse for education to Glasgow and other Universities, where more rational proceedings are adopted. The Town-Council and the Police Board would have been better employed in rectifying those errors, than in attending to foolish speeches and reports upon a question of agriculture, the speakers upon which only succeed in demonstrating their own miserable ignorance. They have

talked of fever produced by a valuable agricultural operation ; but above 400 persons are daily employed during the seasons of summer and autumn upon the meadows irrigated by waters proceeding from Edinburgh. No inquiry was made at these persons whether they laboured under fever or any other disease, in consequence of their employment ; or whether fever abounded most in Edinburgh at the season of the year in which irrigation is employed. Nor was any inquiry made, how far other Scottish towns did not suffer equally with Edinburgh from fever. The representation in the Police pamphlet is, that fever has decreased in almost every large town except Edinburgh ; whereas, according to a remark of a very learned and intelligent medical practitioner, Mr William Tait, himself a Commissioner of Police, and no way connected with the owners of the meadows, it would only have been necessary to look to Glasgow. He has justly said, " The following table will give an idea of the gradual increase of fever in Glasgow, in hospital, district, and private patients ; and shew to the inhabitants of Edinburgh good grounds for congratulating themselves on the salubrity of their City."

See Observations on foul-water irrigation.

" In 1835, there occurred,	.	.	.	.	6,180
In 1836,	.	.	.	.	10,092
In 1837,	.	.	.	.	21,800"

It is unnecessary to offer any comment on the above table relative to Glasgow, near which there is no irrigation. Compare it with Edinburgh.

The cases of fever reported to the authorities in Edinburgh, and brought to public establishments, in two years, that is, from October 1836 to October 1839, are 4850 ; being the number, in these years, admitted into the Infirmary and auxiliary Fever Hospital.*

Again, as to the season of the year in which fever prevails most in Edinburgh, the following table, brought forward by Mr Deuchar (as secretary of the Edinburgh Fever Board) before the Physical Society, explains the state of the fact. It states the total number of cases

* See Dr Pulteney Allison " On the Management of the Poor in Scotland," p. 15.

of fever that occurred in Edinburgh in a period of nine years, and the months in which they occurred :—

"February,	(9 years)	810	August,	(9 years)	678
March,	...	845	September,	...	783
April,	...	701	October,	...	888
May,	...	749	November,	...	10,90
June,	...	712	December,	...	11,76
July,	...	631	January,	...	11,66"

This table also speaks for itself. It proves, that it is not in the months of July and August, when vegetation and labour are proceeding on the irrigated grass-lands styled meadows, that fever abounds in Edinburgh, but in the depth of winter, when cold prevails, and destitution among the poor from want of regular employment, a subject on which more will be afterwards said. But surely, if the Police Committee and their Chairman possessed, not science, but a moderate portion of sound judgment, they might have known, that poverty, with its natural accompaniments of cold, hunger, and nakedness, and crowded habitations, are sufficient to account for the existence of disease, without having recourse to a cause existing at a distance, and which certainly is not new. In reality, these men know not the amount of the mischief their proceedings tend to accomplish. It will presently be seen, that, in effect, they propose to deprive the proprietors and tenants of the lands near Edinburgh of the dung of above 3000 cattle,—the markets of the carcasses of about 3000 beasts,—and the community of the milk and butter yielded by more than 3000 milch cows.

In the mean while, the agitation having been so far successful as to obtain countenance from public boards, and even to be at this moment made the subject of averments before a Committee of the House of Commons, and to threaten an attack on the legal vested rights and property of the owners of the irrigated lands, they find it necessary to endeavour to do justice to themselves, their tenants, and the public, by explaining correctly the nature and effects of the irrigation which they and their predecessors have for ages practised, and the gross ignorance of those who calumniate both them and the City of Edinburgh.

To avoid embarrassing the subject by that sort of confusion of statement which forms the most prominent feature of the pamphlet circulated in name of the Commissioners of Police or their Committee, it is to be observed generally, that two complaints are made against the irrigation practised near Edinburgh. *First*, That the meadows thereby formed give forth an offensive smell; and, *secondly*, That they are injurious to the health of the inhabitants.

The first of these objections, forming, as it does, a popular, and, with most persons, the principal ground of attack, shall be first disposed of.

Causes of the complaint of Offensive Smell.

There are two foul burns or streams by which, near Edinburgh, land is irrigated, for the purpose of producing meadows yielding liberal crops of grass. They are natural streams, defiled by contact with the city. One is on the west, by which about 40 or 50 acres are under irrigation. Let it be specially observed, that, in the pamphlet under consideration, nothing is said about smell proceeding from those west meadows: it is against the meadows on the east, watered by the foul burn, a rapid and copious stream, in that quarter, that the present attack appears to be directed. That eastern foul burn is supplied by powerful perennial springs from the bed of the ancient North Loch, the foot of the Castle rock, and territory on that side, as well as from the southern part of Edinburgh and the hills of Arthur's Seat; to which are added, the impure waters that proceed from the houses, streets, and lanes of the city. The greater part of the streams or feeders of that burn converge or unite about half a mile below the Canongate and the Palace of Holyrood, in a narrow ravine, where the current was anciently used as the moving power of a mill, the name of which was *Clockmill*. At this point, Clockmill, the water is crossed at right angles by a bridge and high road, formerly used as the only high road by Jock's Lodge to Portobello, Musselburgh, and ultimately to London in that direction. The high road still remains, proceeding eastward by Jock's

Lodge and Piershill Barracks, along the side of the hills of Arthur's Seat. From the ravine at Clockmill Bridge, the land spreads out eastward, forming a valley of considerable breadth, and entirely a rural territory. The valley, to a certain distance, is the property chiefly of the Earl of Moray, but partly of Sir James Montgomery, or Mr Brown, his tenant under a long lease, and a part of it belongs to the minister of South Leith as glebe-land.

At the distance of more than half a mile below Clockmill Bridge, and situated in the midst of the valley at another bridge, is the ancient and thriving village of Restalrig, not without renown in Scottish history, and of which more will afterwards be said. Beyond that village, in which the mansion-house of the barony of Craigentenny, and other substantial and some very elegant buildings are situated, the land belongs chiefly to Mr Miller, and reaches to the sea; his lands of Craigentenny being above a mile in breadth along the coast, with only one house upon them in that direction, viz. the farm-house of Fillyside Bank, the property of Mr Miller. On that farm, from time immemorial, a mill for grinding and thrashing corn existed, and was moved by the water-power of the foul burn. The mill was only removed in 1820.

Now, let it be specially observed, that while matters remained in the state now described, that is to say, while the high road to Musselburgh crossed the foul burn at Clockmill Bridge, nobody in the City of Edinburgh heard of the irrigated meadows as productive of a smell offensive to the inhabitants. In reality, the foul burn was scarcely known to one-twentieth of the citizens, that is to say, they took no notice of it, and heard nothing of its quality. Yet the irrigation not only then existed, but the water was used in a much more offensive form than now occurs. Between Clockmill Bridge and the village of Restalrig, there were no fewer than thirteen pools, ponds, or tanks, in which the water was made to stagnate, in order to collect the soil that might be deposited in them, with the view of its being used as manure. These have several years ago been all filled up, with only a single exception on the lands of the Earl of Moray. To the eastward of the

village of Restalrig there were six more pools. These have all been long since filled up, and no such pools now exist on Mr Miller's lands.

It so happened, that, in 1814, a resolution was adopted by the authorities of Edinburgh, to employ funds to be levied by local taxation in cutting down a part of the Calton Hill to nearly a level with Prince's Street, and in forming a road along that hill, and across Lord Moray's irrigated meadows, and the foul burn there, so as to join the ancient road near Jock's Lodge. The road was artificially elevated where it passes the meadow, and made to proceed in a diagonal direction, so as to linger above the foul burn, and the irrigating operations which, to a considerable extent, it necessarily diminished. This operation was in a year or little more followed by a new undertaking, the establishment of Coal Gas-works in the Canongate. As these have been managed in Edinburgh, they give forth an abundant stream, the odour of which is no doubt extremely offensive, being the most nauseous of all compounds. This flows into a principal feeder of the old foul burn at the south back of Canongate; and this feeder, mingling its waters with the other feeders above Clockmill Bridge, renders the whole stream offensive in a degree totally unknown in ancient times. The result is, that, being of necessity used in the irrigation, it produces from thence an offensiveness, which formerly was never heard of or known.

The materials that proceed from the Gas-works are of no value to the proprietors of the irrigated meadows; and thus, without opposition from them, a remedy for the obnoxious smell could at all times have been obtained. *First*, Restore the eastern high road to its ancient direction across the narrow ravine at Clockmill Bridge; and *secondly*, remove the Coal Gas-works, whereby matters would return to their ancient state, and the inhabitants of Edinburgh in general would be as ignorant as formerly of the course, or even of the existence, of the foul burn, or of the irrigated meadows. There is still another remedy. The Commissioners of Police are empowered, by the statutes establishing the Gas-works (58 Geo. III. c. 67, and 10 Geo. IV. c. 2), to compel the proprietors of these works "to abate any noi-

some or offensive liquids or substances conveyed into any drain, sewer, or ditch, communicating therewith."

Thus, if an offensive smell proceed from the foul burn, and annoy those passing along the new road from Prince's Street by the Calton Hill to Jock's Lodge, it is not by the proprietors of the irrigated meadows that this offensive odour is created. It brings to them no benefit or advantage. It was created and imposed upon them for the profit or pleasure of others, or by speculations of a public or private nature, in which they had no share. They can with no justice be required to suffer a loss or forfeiture of their legal rights or property on account of it. They do not admit that its effect on irrigation is such as the absurd speculators in the police pamphlet are pleased to describe; but, whatever its effects may be, it is certain that they are not produced by the ancient practice of irrigation, the nature of which will be immediately stated. It will presently be explained, that, by new local statutes, a remedy has been provided, which, if enforced, and not neglected as formerly by the Police Board of Edinburgh, will remove every just ground of complaint.

The western irrigated meadows are within half a mile of the most recent and most splendid buildings in the New Town of Edinburgh. But the greatest nuisance near that quarter is from the enormous mass of City dung deposited by the Commissioners of Police. It is only in a moist and calm summer evening that any smell can be perceived from the west meadows, even by those standing upon these meadows, or in contact with them, or with those of the Earl of Haddington at the foot of Salisbury Craigs. The reason is,—they have no communication with the Gas-works. They who have been long resident in Edinburgh, and have experienced the powerful gales to which the City is exposed, need not be told how few of the tranquil and warm summer evenings now referred to, they have known in Edinburgh, refreshed as it is by blasts from the sea, on the one side, and from the mountains more or less distant on the western quarters.

If the Committee of Police, and their Chairman, are so grievously distressed by offensive odours, it might be well

See "An
Examination
of the State-
ments" in
Police Pam-
phlet.

that they should direct their attention nearer home. Mr Tait has justly said, "Nowhere could we expect diseases of any kind, and more especially fevers, to be more prevalent than in and around those Augean stables of filth and nastiness situated between the back of the Castle and West Port. It cannot be asserted that it can vie in comparison with the unparalleled Montfaucon; but, besides the dirty operations usual in a tannery, we have here, in the centre of Modern Athens, a regular dung-manufactory, with dung-tanks of goodly dimensions, in a state of perpetual fermentation, and constantly imparting to the atmosphere volumes of offensive odours, yet we have no proof that this locality is more unhealthy than any other district in Edinburgh. From a careful perusal of the records of the Fever Board, we are prepared to state, that fewer cases of fever have occurred there, in proportion to the population, than in any other part of the Grassmarket. In fact, during the last three years, more cases of fever have occurred in Blackfriars Wynd, High Street, alone, than in all the West Port and the dwellings around the tan-works alluded to, although the population of the latter is six times greater than the former." (P. 235.) The cause of the difference is, that the inhabitants of the West Port have good wages, whereas the other district referred to is inhabited by persons in a state of grievous destitution from poverty.

In the Police Committee's pamphlet, some small attempts at irrigation are mentioned, as made on the property of Heriot's Hospital, or elsewhere, of which the proprietors on the foul burn know nothing. The small attempts at irrigation referred to, if defectively made, and not according to the true principles of that branch of the most important of all arts—that of Agriculture—are entitled to no protection; and surely the Governors of Heriot's Hospital, consisting of the Magistrates and Ministers of Edinburgh, were accessible to the Police Committee and their Chairman, without agitation by newspapers, public meetings, and the publication of a pamphlet. True, the Board of Police, containing sundry Writers to the Signet, are fortunately restrained from expending public money in litigation; but no such restriction is imposed on private

persons. Nobody has disputed that new and deleterious operations attempted to be introduced into the immediate vicinity of dwelling-houses may be successfully resisted by "interdict before the Court of Session, which may be brought by any individual aggrieved;" but, it is added by the Committee of Police, "who shall be found willing to enter into protracted litigation with such proprietors?" (P. 9.) This last is truly an improper statement, proceeding, as it does, from a Writer to the Signet, who knows, or ought to know, that, in Scotland, at this day, justice is obtained more speedily, and with less expense, than in any other part of the British Islands. He knows that any ordinary tenant does not hesitate to encounter at law the greatest and noblest proprietor in the land, and to do so with success, when his case is well founded; and he cannot fail to know what multitudes of cases exist on record, of litigations by proprietors in Edinburgh about the most paltry deviation from an alleged public building-plan, or the encroachment by placing the name of a dealer too high or too low on the front-wall of a house. The true subject of regret with the agitators is, that they are aware that no well founded ground of complaint exists against the practice of agricultural irrigation as practised to the eastward of the city, as will be presently explained.

Question of Health.

But a *second* ground of complaint is stated, viz. That the irrigation practised by the proprietors near Edinburgh is pernicious to the health of the inhabitants of the City of Edinburgh. This, undoubtedly, is a question of high importance; and, accordingly, it is to that question that the certificates, and other statements mendicated by the Police Committee, and the whole pamphlet published at the expense of the Commissioners, are chiefly directed. The general import of the pamphlet is, that the proprietors of the irrigated meadows derive from them a profit of L.5000 per annum, and that the grass which, in virtue of irrigation, these meadows produce, supports in Edinburgh 3300 cows, and in Leith 600 cows, during the season. How far this calculation of numbers is correct, the proprietors do not know; but it is admitted that they derive profit from

the practice of irrigation. One of them, Mr Miller, says, that for the last twelve years he has drawn of rents from his irrigated meadows on the sea-shore, between two and three miles from Edinburgh, sums to the amount of above L.30,000, without loss, excepting in three instances to the amount in all of about L.50, and this, too, without incurring L.10 of expenses for legal proceedings. He may challenge four-fifths—aye, the whole—of the landed proprietors of Scotland, to shew such a sum drawn, with equal success, from an equal multitude of occupants of their lands in small portions. The fact now stated, demonstrates the perfect integrity, accuracy, and respectability of the dairymen, styled cow-feeders, of Edinburgh, Leith, and Musselburgh, each of whom generally keeps only from twenty to forty cows.

But the pamphlet put forward by the Board of Police, or its Committee, proclaims, that all this profit, resulting from irrigation, is obtained at the expense of the health of the inhabitants of Edinburgh. To support that averment, the irrigated lands are described in the most fearful terms. The foundation of the whole charge is, that they are *marshes*. It is impossible not to observe, on the slightest perusal, that the word *marsh* is prominently put forward as the ground of complaint. The practice of irrigation is held forth in the pamphlet as converting the land into *marshes*. The only additional complaint is, that there have been formed on the irrigated meadows numerous tanks or pools for the collection of manure. Under this last exception, the pamphlet is occupied with an incessant repetition of the word *marshes*, and a detail of the effects on health that *marshes* are supposed to produce. It is said that Edinburgh is surrounded by 2000 acres of *marshes*; and reference is made to the effect said by travellers to be produced by marshes in India, in Batavia, in Jamaica, in Egypt, in Italy, and elsewhere, by the cultivation of *rice*; and the *climax* is wound up by referring to the southern part of the United States of America; and saying, that, in the vicinity of marshes, “not only the inhabitants appear sallow, weak, and listless, but the term of natural life is shortened. On the banks of the Lower Loire, fifty years is the extreme of life, at which age men

seem to be past eighty. In the Delta of Egypt, in the American Georgia and Virginia, many districts have a population whose life is extinguished at forty; and at Petersburg, in the latter state, no native inhabitant has been known to pass the age of twenty-eight." (P. 19.)

Now, marshes are universally described as *green bogs* or *fens*, in which water stagnates, and putrefaction abounds. These are said to produce what is called *malaria*, or bad air, alleged to contain some theoretical substance called *miasma* or *miasmata*, productive of agues or intermittent fevers. The irrigation practised near Edinburgh is accordingly represented as of this description. The irrigated meadows are styled by the Chairman of the Police Committee, and the authorities he relies on, as "stagnant marshes, and fetid stagnant marshes." They are represented as producing marsh effluvia. They are styled "a pestilential *swamp*," and "artificial marshes." (P. 17.) They are represented as containing "vegetable substances macerated in the shallow stagnant water of marshes." (P. 18.) They are called "a poisonous swamp" of 2000 acres. (P. 22.) They are styled "a vegetable swamp" (p. 30.); and "stagnant pools and marshes" producing "fever in the immediate neighbourhood." (P. 31.) It is said, that in these marshes "every species of organic matter supports a perpetual putrefaction." (Ib.) A complaint is made of "the miasma of the putrid marshes" as aggravating wounds, so as to prevent them from healing;—that "the cholera of 1832 was more prevalent in the district adjoining these *myres* than in other localities," (p. 64.);—that cattle will not eat the grass which they produce;—that the cattle, when they do eat, become unhealthy, and speedily die, and the milk they produce is unsound, &c. &c.—But it is fruitless to make farther reference to special statements, because the whole pamphlet amounts to an assertion, that the irrigated meadows consist of a putrid marsh, abounding in tanks or pools for the collection of manure; that wounds suffered by persons employed in the vicinity, or upon them, produce gangrene; and that intermittent fevers abound chiefly in the neighbourhood of them. In the fulness of their zeal, some of Mr Drysdale's supporters speak of such marshes as

producing “ palsy, apoplexy, and idiocy,” (p. 19.); and to the same cause are referred “ jungle fever, Bulam fever, yellow fever, and bilious remittent.” (P. 21.)

Here, to avoid obscurity, attention is requested to two remarks :—

Attempt of
the Police
Board to
make tanks
to collect
muck or
manure for
sale.

1. When their Committee and its Chairman were bringing before the public in name of the Board of Police of Edinburgh, a publication containing so much bitter reviling against tanks or pools, calculated to produce stagnation of the water of the foul burn for the collection of manure, were they aware, or was its zealous Chairman aware, that, in 1834, the Board of Commissioners of Police of Edinburgh circulated the heads of a proposed Police Bill, proposing to enlarge the territory under their superintendence, and by clause 112 of which the Commissioners were to take powers “ to construct tanks, cess-pools, &c., for collecting the manure within the bounds of police ?” The avowed object was to make a *dung* speculation by collecting soil from the foul burn, and selling it for the benefit of their funds. Was Mr Drysdale aware of the fact, that the Commissioners actually brought their Bill into Parliament, proposing to enlarge the bounds of the Edinburgh Police, and that the Commissioners imposed on their fellow-citizens taxes to defray their expense, to the amount confessedly of above L.4000, spent in unjustifiably harassing the proprietors of the irrigated lands, and in obtaining agreeable excursions to London? When there they became ashamed of the filthy project, and kept it out of their Bill, but urged the extension of their territory and a grant of power to invade the property of all and sundry, and to create a tunnel adequate to hold the foul burn.

The old pools
to collect ma-
nure are now
filled up.

2. As already remarked, the nineteen pools or ponds that formerly existed for the purpose of collecting manure, have all been filled up except one. The reason is well known. The City of Edinburgh stands on a great elevation ;—the Cross being betwixt 300 and 400 feet above the sea, to which the foul burn naturally descends with great rapidity, and its velocity is apt to be increased, by sudden showers, in an extraordinary degree, so as to sweep down the streets and lanes, carrying all refuse matters and soil

suddenly along. The effect is, that these pools or ponds were apt to be filled to a considerable amount with sand, of no use as manure; and, in the next place, the matter otherwise contained in them could not be used without farther preparation, because hay-seeds and other seeds scattered on the streets and stable-courts were swept along into the foul burn. It is the known quality of all ripe and perfect seeds that they sink in water, and hence they abounded in the matter found in the stagnant pools. That matter, therefore, could not be used in gardens or lands under the plough till it should undergo putrefaction, from being mixed with stable-dung. Thus, it was a defect of these pools, that they were not putrid, or that a putrid fermentation did not occur in them.

The imaginary tanks or pools erroneously supposed to exist in the irrigated meadows being thus disposed of, the next question is:—

3. Are these irrigated meadows truly *marshes* or putrid swamps, as alleged by the Committee and their Chairman? Do these profitable meadows consist of a swamp in which water stagnates, and in which vegetable and animal matter are incessantly undergoing putrefaction or a putrid fermentation? This is a question of fact. On the part of the proprietors, it is specially affirmed that, on their lands, there are no marshes, no putrid marshes, no stagnant marshes,—that they produce no intermittent fevers as marshes do,—that cattle thrive on the grass reared on them, and yield dairy produce of the best quality,—that the persons employed on them and around them enjoy good health,—that the ancient village of Restalrig, situated in the centre of them, is one of the healthiest in the Lothians, and is inhabited by a population by whom the young are reared with success, and the old attain to the full measure of human life, without suffering from any special malady. The opposite averments are distinctly untrue, and, in particular, the averment is false that this village suffered from cholera. On the contrary, while Glasgow lost its thousands by that visitation, and Edinburgh perhaps 1200,—while Musselburgh and Inveresk, formerly styled the Montpelier of Scotland, under-

Are the irrigated meadows marshes?

went the most fearful suffering and mortality,—while the watering-place called Portobello suffered also severely, and Dumbarton, Dumfries, and other beautiful towns were covered with mourning, the pestilence passed harmless over this village of Restalrig, situated amidst the irrigation in question; and Jock's Lodge and Piershill Barracks, on the declivity which looks down on these meadows, remained safe from that fearful disease, the Asiatic cholera, which baffled every effort of medical science. It is said that one, and only one individual in the Barracks suffered, in consequence clearly of communication with the neighbouring city of Edinburgh, while labouring under disease.

From this fact, the palpable ignorance,—shall it be added, the bad faith—must be obvious, which has dictated the compilation of the pamphlet under consideration.

IRRIGATION EXPLAINED.

In approaching the question, how far the averments are true, that the irrigated meadows are putrid marshes or swamps destructive to the health of men and animals, it appears first of all necessary to explain what an irrigated meadow truly is, and what is meant by irrigation of land with a view to increase the produce of valuable grass. Truly, it seems a strange circumstance that such explanation should be requisite, not merely to a Committee of Police, but to about a dozen of Edinburgh doctors, professors, physicians, chemists, some eminent, and all undeniably qualified to act in their departments, yet so strangely ignorant of the ordinary principles and practice of agriculture, as, to render this explanation necessary. True, the irrigation of land is unfortunately little practised as yet in Scotland, and hence the Chairman of the Committee, who himself ought to have known better, has found it possible to fill the imaginations of those learned persons with a notion the most utterly absurd, that meadows, successfully irrigated, either are, or by any possibility can be,

stagnant, putrifying, and fermenting marshes and swamps ; that is to say, that such meadows contain stagnant water either above or below ground, or even, that such a meadow bears any resemblance to lands in warmer climates in which a crop of *rice* is cultivated. Be the quality of the irrigated meadows what it may, this at least is certain, that, instead of 2000 acres, they do not amount to a tenth part of that extent. They consist, of about 40 or 50 acres to the westward of Edinburgh ; of about 28 or 30 acres between Clockmill and the village of Restalrig, belonging chiefly to the Earl of Moray, but small portions also to Sir James Montgomery and his tenant Mr Brown, and to the glebe-land of the minister of South Leith. The remainder from Restalrig to the sea, extending a mile along the shore, belong to Mr Miller. Of that space about 50 acres are ancient, or have existed for ages, and all (under an exception to be afterwards mentioned, of meadows adjacent to the sea) existed at the beginning of the present century. No material increase in the extent of his irrigations has been made during the last nineteen years, although a small interchange of arable with as much irrigated land, occurred about twelve years ago. The Police Committee complain much of 14 acres belonging to the Earl of Haddington at Salisbury Crags ; but these have ceased to be irrigated. Thus, the whole of the irrigated meadows, of which the greater part are on the sea-shore, nearly three miles from Edinburgh, amount to less than 200 acres. These meadows are scattered over a space of about six miles from Coltbridge to the sea, where it washes the lands of Craigen-tinny. A circle of six miles in diameter contains 17,920 acres, so that, even if the meadows extended to 200 acres, they would only cover a seventy-ninth part of the space occupied by the town, and, as already mentioned, they are not merely on the outskirts but chiefly situated along the sea-shore, at a distance of three miles.

But, wherever situated, it seems necessary to explain to this wise committee of the Edinburgh Police, and their doctors, what sort of an article an irrigated meadow is.

That the description now to be given of the nature of an irrigated meadow may as little as possible be supposed to rest on the assertion of interested parties, it shall be taken generally from published statements, not, indeed, of physicians or chemists, born and reared and practising their art in large towns, but from persons eminently skilled in agriculture, or from publications of acknowledged respectability, conducted by men known in the literary world.

In the Quarterly Journal of Agriculture, conducted with eminent ability and intelligence by Mr Stephens, reference is made to the agitation attempted to be got up against the meadows in question, and some remarks are found which may prove instructive in relation to them. (No. xlvi. p. 259.) “Irrigation cannot be successfully practised with stagnant water of any kind, for the moment water is allowed to stagnate on plants, whose nature is ungenial to that state, they become sickly and die, and their places are soon occupied by others, whose nature is congenial to that state. The plants produced in stagnant water are coarse, and quite unfit for the support of live-stock, for whose maintenance these meadows are purposely irrigated. To ensure, then, the existence of the proper plants, and to promote their forced growth, the water of irrigation is made to flow over the plants in a continuous stream, and only for a certain number of days; and when the water has run for that certain number of days over the same piece of ground, it is directed for a definite time over another piece of ground, off which the crop of grass has been previously mown and carried away. Different pieces of ground are thus irrigated in succession, and the same piece of ground is irrigated at intervals of time, measured by the progress of vegetation; but upon one and all of them, under whatever varying circumstances they may be, the water at no time is allowed to stand still one instant. To ensure the constant and uniform currency of the water, the ground is previously carefully prepared for the purpose by a practised irrigator, and the cost of so preparing it is, under the most favourable circumstances, not less than from L.20 to L.25 per acre. It

is, therefore, the *interest* of the irrigator to ascertain that no *stagnant* water is permitted to rest on his meadows; and, for this purpose, at the time when there is a cessation from irrigation every year, all the main channels through which the water flows, and the subsidiary ones which convey the water uniformly over the declivity of the ground, are cleared out. This operation is attended with the considerable yearly cost to the irrigator of from 10s. to 15s. an acre, which, of course, he would not voluntarily incur, unless it were necessary for removing the obstructions to the continued flow of the water in the season of irrigation.

“ Since the water of irrigation would be injurious to the plants irrigated were it stagnant, the ground over which it passes cannot, in truth, be denominated *marshy*, that term being used by lexicographers synonymously with *bog*, *fen*, the condition of which implies stillness of existence. All marshy grounds are covered with what botanists call semi-aquatic plants, a class quite unsuited to the irrigated meadows of this neighbourhood, and not to be found in them. Indeed, the plants which compose them are rather indigenous and conformable to a *dry* soil; and this statement in connection with water-meadows need not excite surprise, when it is considered that irrigation cannot be successfully prosecuted but on soil either naturally dry enough to absorb and carry off superfluous water, or rendered so by draining. Stagnant water in the soil is injurious to cultivated vegetables at all times, and it is more obviously so when irrigating water is made to flow over it; because the ground which covers the stagnant water below, receiving an excess of water by irrigation, throws out the useful plants, and promotes the growth of the semi-aquatic ones. Wherever semi-aquatic plants are, therefore, seen growing on water-meadows, there, under them, assuredly will be found stagnant water, which cannot be removed but by draining.” The name of *marsh* applied to an irrigated meadow is, therefore, a *false appellation*. After discussing the subject of the Edinburgh meadows in relation to their value and the question of health, and quoting Mr Tait’s “ Observations on Foul-water Irrigation,” Mr Stephens adds,

“The narrow-minded attempt of the corporation of London to prohibit the use of coal-fires in that city, from a supposed contamination of the air by the smoke, is on a par with the attempts of our own corporation against the water-meadows; and their efforts, we hope, will prove as futile as those of their great antitype. Let man be content, and ‘drink the air before him’ as he finds it. In expressing these our sentiments, we have no personal interest in the prolonged existence of these meadows; but we do feel a very strong interest in the improvement of the soil, in the increase of the value of land, in the increase of its produce, in the increase and proper treatment of livestock, and in the increase of the necessaries of life for the whole community,—from the wealthy, who have no need to work, to the poor, who must work hard for their subsistence; and when we perceive these interesting objects in danger of being deteriorated, our indignation is roused against the intermeddlers; and no deference to an opinion expressed on agricultural matters, if prejudiced, though expressed ever so publicly, will induce us to refrain from counteracting that opinion.” (P. 271.) The statement given by Mr Stephens of the nature of irrigation is correct, and is supported by abundance of authorities.

Agricultural
Survey of
Wiltshire.

In the Agricultural Survey of Wiltshire by Thomas Davies, published by the Board of Agriculture, it is remarked, that “irrigation, which is justly called by Mr Kent ‘the greatest and most valuable of all improvements,’ was generally introduced into this district at the latter end of the seventeenth, or at the beginning of the eighteenth century.” (Page 116.)

“A water-meadow is a hot-bed for grass. In what manner water acts upon land so as to accelerate vegetation, is a philosophical problem which it is not the farmer’s province to solve: it was sufficient for him to know that the fact was so. Observations on the effects of water so brought on, soon shewed him at what period its good properties ceased to act, and when it began to do mischief. This observation, therefore, regulated the time of keeping the water on the land; and as this period varied according to the nature

of the soil and the season of the year, it became necessary that he should have such a command of the water as to take it off immediately when he found the state of the land required it. This produced by degrees that regular disposition of water-carriages and water-drains, which, in a well laid out meadow, bring on and carry off the water as systematically as the arteries and veins do the blood of the human body." (Page 117.)

Attention is very specially requested to the following statement by Mr Davies:—"It has been alleged by those who know very little of water-meadows, that they render the country unhealthy by making the water *stagnant*. Daily observation shews that this opinion is erroneous, and the reason is obvious. We have already observed that a water-meadow is a 'hot-bed for grass:' the action of the water on the land excites a fermentation; that fermentation would no doubt finally terminate in putrefaction; but *the moment putrefaction takes place vegetation ceases*. Every farmer knows the commencement of this putrefaction by the scum the water leaves on the land; and if the water be not immediately taken off, *the grass will rot, and his meadow will be spoiled for the season*. The very principle of water-meadows will not allow water to be stagnant; it must be always kept in action to be of any service. But, besides this, many of the best meadows were, in their original state, a stagnant unwholesome morass: The draining such land, and making it so firm that the water may be taken off at will, must surely, instead of injuring a country, essentially contribute to the salubrity of the air." (Page 122.)

In the different surveys obtained by the Board of Agriculture, similar statements are made. (See the Survey of Middlesex, by John Middleton, Esq., and the Reports in Vols. iii. and vi., by Mr Lindsay of Lanarkshire, the Rev. Dr Singer, and others.) But reference may particularly be made to the Seventh Edition of the Encyclopædia Britannica, a work in which, from its commencement more than forty years ago, great learning and labour have been expended, and of which, an improved edition

(the Seventh) is in the course of publication by an Edinburgh citizen, Mr Black, bookseller, who is understood to have invested in the work a large capital. The publication is conducted by Professor Napier as editor. (Vide Irrigation, p. 445.) In that learned work, the distinction is pointed out between irrigation for the production of grass as food for cattle, and the irrigation employed in rearing crops of rice in hot climates, in which last water is made to stagnate, and thereby does form an unhealthy marsh. (P. 470.) The committee of Police will, perhaps, to their surprise be informed, that the costly *Parmesan cheese*, by which they adorn their festivals, is not only produced by irrigation, but by *foul-water* irrigation from cities, and even that the soil of the magnificent City of Milan, anciently the capital of the Gauls, and containing perhaps 250,000 inhabitants, is employed in the same way in which the foul burns of Edinburgh are employed. Nay, its principal street, containing the palace of the Viceroy, and many of the splendid mansions of the nobles, opens out upon an irrigated meadow.

“ *Irrigation.*—A hasty inspection of irrigation and draining would lead to the belief, that they are founded on opposite principles. It is seen that draining deprives the land of water, and that irrigation, on the contrary, supplies it with water. It is obvious, that the great object of draining, and particularly of furrow-draining, is, to present surface-water, which descends through the upper soil to the retentive substrata below it, with frequent opportunities of egress ; and it is also obvious, that the great object of irrigation is, to supply the upper soil, the firm foundation on which plants rear their superstructures, as much of surface-water as it can retain, for the purpose of promoting increased vegetation. Notwithstanding this apparent difference in principle between them, both induce similar effects, but the origin of which, lying deeper than the surface of the ground, might easily escape the notice of superficial observers. Both operations, in the first place, are meant to prevent all *stagnation* of water in the upper and under soils ; both, in fact, create currents of water in the soil, and these

circumstances are, of themselves, quite adequate to explain the effects of draining and irrigation, on the same principle and for the same purpose—the promotion of vegetation. It has been found that all plants usually cultivated in agriculture, cannot survive in stagnant water, and that in it their places are taken by others of a coarse nature.” (Encyclopædia Britannica, vol. xii. p. 445.)

It is added in the same work, “that although irrigation presents a copious flow of water to the soil, yet it provides the means of drawing off the redundancy in sensible currents, and preventing stagnation. As draining has the effect of rendering retentive subsoils porous,—so irrigation is practised with most effect on porous soils. In short, so dependent are irrigation and draining on each other, that the former acts most beneficially only in conjunction with the latter. Thus, the principle which is common to draining and irrigation, is the *prevention of the stagnation* of water, and although of a negative character, it affords sure outlets to the superabundant moisture, and directly promotes vegetation.”

After describing precisely the art of irrigation in its different forms, it is added in the same work: “In Great Britain, irrigation is practised to the greatest extent in Gloucestershire, Wiltshire, and Dumfriesshire, and partially in some other counties. In England, it has long been successfully practised. Into Scotland it is comparatively of recent introduction. The estates of the Duke of Buccleugh on the Esk, Ewes, Yarrow, and Ettrick rivers, first enjoyed the benefits of irrigation to any extent in Scotland; but it is painful to observe, that those water-meadows have fallen into decay from inattention. The land is now in a worse condition than if it had never been irrigated; because, the very means which were used to direct the water to the land for beneficial irrigation, now form receptacles, in which surface-water stagnates. Many of these meadows have since been broken up for corn-culture, the high price of corn during the war having tempted their destruction. Now that live-stock remunerates the farmer better than corn, the rash step of destroying them has no doubt been by this time sincerely repented of. The water-meadows belonging to

Mr Menteith of Closeburn in Dumfriesshire, were formed about the same time, but having, since their formation, been carefully attended to, they continue to yield abundantly." (P. 451.)

" But this enumeration of the several cases of successful irrigation would be incomplete, were the water-meadows in the neighbourhood of Edinburgh omitted to be particularised. The City of Edinburgh stands on an eminence which commands the cultivated country around it. Commanding as the situation is, water from the Crawley Spring in the Pentland Hills, situate at seven miles distance, flows to the top of every house in the City. A ready means is thus provided of washing away all the filth of the houses and streets, which is conveyed in large sewers to the lower end of the town, where their contents are made to irrigate many acres of naturally rich and also of poor soil.

" Probably, upwards of 200 acres are thus irrigated for the production of grass for the cowfeeders, who supply milk to the inhabitants. The rent for which these meadows are let in small portions to cowfeeders, varies, on an average, from L.20 to L.30 per acre. Some of the richest meadows were let in 1835 at L.38 per acre ; and in that season of scarce forage, 1826, L.57 per acre were obtained for the same meadows. The largest proprietor of these meadows, is Mr Miller of Craigentinny, who possesses about 130 acres ; part of them comprising land now of the richest quality, having been thus watered for *nearly a century*, and part of them of the poorest sandy soil. The waste land called the Figget Whins, containing 30 acres, and 10 acres of poor sandy soil, adjoining them, were formed into water-meadows in 1821, at an expense of L.1000. The pasture of the Figget Whins used to be let for L.40 a-year, and that of the 10 acres at L.60. Now, the same ground as meadows, lets for L.15 or L.20 an acre a-year, and will probably let for more as the land becomes more and more enriched. It is stated by Mr Stephens, that 110 acres of Mr Miller's meadows in 1827, yielded a clear profit of L.2300. The repair of these meadows costs from 10s. to 15s. per acre, which is comparatively a large sum for repairs ; but then they are not only

watered during the winter, but for two or three days between the intervals of cutting the grass during the summer. The grass is cut from April to November every three, four, or five weeks, according to the richness of the vegetation. It is exceedingly tender and succulent, and suitable to the production of a large quantity of milk, and were it not frequently cut, it would lie down and soon rot at the roots." (P. 452.)

There is, farther, given by the learned editor of the same work, the history of irrigation, which is traced to the earliest antiquity in the writings of Moses, and, at a later period, in the practice of the Romans. It is recommended by Cato the Censor. Colomella gives rules for conducting it; and in particular, for preventing any stagnation of the water employed in irrigation. Pliny specially mentions it, and the Romans are thought to have introduced it into England. But after the fall of the Roman empire, agriculture declined. "Irrigation was, perhaps, the only branch of agriculture which received improvement or extension before the expiration of the dark ages; and its improvement at that time was even confined to the north of Italy. The irrigation of Lombardy to this day forms the principal feature of its agriculture. The Lombard kings, following the example of the Romans, encouraged and extended irrigation, and they were ably assisted by the inmates of their numerous and wealthy religious establishments.

"Under these favourable auspices, irrigation had been extended on a great scale in Lombardy as early as 1037; and such expert hydraulic engineers had the monks of Chiarevalle become, that they were consulted and employed as such by the Emperor Frederick I. in the thirteenth century; and ever since so assiduous has been the care with which the agriculturists in Lombardy have preserved entire and in good working order their water-meadows, that, at the present day, no other part of the globe can exhibit that operation on so grand a scale and in such excellent order, and producing so rich a pasturage, verdant throughout the year. The largest rivers in the north of Italy—the Po, the

Adige, the Tagliamento, and others—are put under requisition for a supply of water in summer and winter for the purposes of irrigation ; the whole country from Venice to Turin being almost one continued water-meadow.” (P. 455.)

In the same work, *v. Lombardy*, it is remarked, that, “as Lombardy is the most densely peopled, so it is the best cultivated district in Europe. In no other part is the benefit of irrigation more clearly understood or more accurately appreciated.” (P. 470.)

The value of water depends upon a variety of circumstances. “In the vicinity of the city of Milan, those winter-watered meadows have the greatest value which are to the south, and are watered from the canal of Vettabia, whose water is furnished by the Riviere Seveso and canal of Martisano, *which flow through the city, and bring with them the precious manure of that populous place.*” (P. 475.)

The crop is estimated at “six loads of the finest hay as the annual produce of an English acre. There is good reason to believe that this may be near an accurate estimate, because the best meadows, frequently in the two mowings of May and July, yield more than at the rate of five loads per acre ; but these are in the vicinity of the city of Milan, *where the water that irrigates them is more fully impregnated with the rich drains from the city than that at a greater distance from it.*” (P. 474.)

In the warm and bright climate of Italy, irrigation is employed to produce grass not merely in summer, as in our northern British territory, but during winter “the most important portion of the land in Lombardy is that part designated as permanent winter-meadows. In laying them down, great attention is paid to levelling the surface, so that no inequalities may prevent the regular distribution of the water in passing over them, and that in no part there may be hollow places in which it can become stagnant. They can only be created in situations where a flowing stream can in all seasons, at pleasure, be turned over them.” “These meadows are well dunged every year, and the omission of it even once is considered, by good cultivators, as an un-

pardonable fault. Thus, if the other descriptions of land are not manured, it is because all of them are sacrificed to the winter meadows." (P. 472.)

The foul matters of the city population, which is more numerous than elsewhere, "are carried into the canals and rivers on which the cities and towns are built; and when *their water is distributed over the first fields* with a gentle motion, to enrich them by the deposition of the matter they contain in suspension, no other manure is required to be applied. Whilst the lower grounds near the cities are refreshed by these means, the higher grounds are supplied with little expense of labour, in the conveyance, from the substances which retain a solid or less soluble form." (P. 473.)

This is just what takes place in Edinburgh. The soluble soil of the city is carried down and distributed by flowing streams over the low grounds; while the police carts carry off, for the use of the upland farmers, the less soluble substances for manure.

With regard to Lombardy, "as the chief profit, as well as the receipt of ready money to the cultivator, depends upon the cheese he makes, it becomes of great importance to him to have an abundant supply of green food to produce the milk; and this which the farmer obtains in the north of Europe, by the use of turnips, mangel wurzel, or meal in tepid water, is supplied in Lombardy, during ten or eleven months, by his winter meadows. It is hence not a subject of surprise, that every other portion of his land is sacrificed by his Lombard farmer to the necessity of raising the product of his winter permanent meadows to the highest possible state of productiveness." "The cows are kept in the best possible condition, in order to enable them to yield milk in the greatest quantity, and of the richest quality." (P. 472.)

The whole of these animals are constantly fed in their stalls; or, if sent out to graze, it is but for a very short period. The use of roots,—such as turnips, ruta бага, and mangel wurzel, is almost unnecessary, as the cattle can be supplied with sufficient green food from the meadows the whole of the year."

An account of the dairy of Lombardy is given in the work now referred to, and of the vast quantity of that cheese styled Parmesan, produced generally in Lombardy, and exported in consequence of the produce of that irrigation which enriches the country. But a distinction is made, which must here be specially noticed, between two subjects confounded in the Police pamphlet,—the cultivation of *grass* and the cultivation of *rice*. It is remarked, that “the climate, on the whole, may be described as healthy; but from that description must be excluded those parts where rice is extensively cultivated.” (P. 469.) In these the watering is the rule, and the letting them dry the exception. The water on them is stagnant during the greater part of the growth of the crops.” (P. 471.)

“Rice is a marsh plant, and can only be grown where the land can be covered with water till it warms, and is very slowly dried up. The evaporation is injurious to human health; and hence *laws are enacted regulating the distance which must intervene between the rice-fields and the cities and towns*. Without these restrictions, rice would be more extensively cultivated.” At present, about 125,000 English acres form the extent of this cultivation. “The time of sowing is from the beginning of April till the middle of May. It remains covered with water to the height of from two to three inches, and in that state remains till weeding becomes necessary. That early sown requires the operation to be performed in the middle of May; that later sown, some time in June. It is executed chiefly by the females, who, with their lower garments tucked up, stand in water over the ankles, and with the hand pluck up the weeds by the roots.” (P. 480.) “About midsummer-day, the water is allowed to run off the land; and, during eight or ten days, it is suffered to become dry.” “At the end of this drying, the field is again covered with water, and it continues until the time of harvest, which is usually the first week of September.” (P. 481.)

It is thus obvious how far there is either intelligence or honesty in comparing the cultivation of *rice* in stagnant

pools, with irrigation by a flowing stream in order to produce grass for the food of cattle.

To complete the evidence on the subject, reference shall next be made to the authority of the learned Professor of Agriculture in the University of Edinburgh, as contained in his "Elements of Practical Agriculture." After mentioning the fertilizing effect of water, and the use of it in ancient and modern times, the Professor remarks, that "the main object of irrigation, however, in all the inter-tropical countries, and in the warmer parts of the temperate zones, seems merely to be to convey to the ground that quantity of water which is necessary for the growth and nourishment of the plants to be produced. Sometimes, as in the case of *rice*, the earth must be saturated for successive months, and in others merely watered at intervals, during the periods of greatest evaporation. In all these cases the main purpose is the same—namely, to supply the deficiency of water in the soil, and this creates a great distinction between that species of irrigation which has been described as called for by the wants of man over so great a part of the globe, and that to which we apply in England the term watered meadow.

"In the latter case the purpose is not to supply the deficiency of water in the soil, for the water is conveyed over the surface at those times, namely the months of winter, when there is an excess and not a deficiency of moisture. Nay, it is held necessary in every well-formed water-meadow *to drain the ground very thoroughly* of all subterraneous water. Nor is this the only distinction between the two kinds of irrigation. In the one, the water is generally allowed to stagnate until it shall have saturated the soil; in the other it is *never allowed to stagnate*, but is maintained in a constant flow over the surface."—(P. 467.)—After explaining practically the art of irrigation, the Professor says, "The theory of the process of irrigation has not been satisfactorily explained. That the effect is not produced by the mere supply of deficient water, appears not only from the period at which the water is admitted,

and when in our climate the soil is always saturated with the fluid, but from the circumstance that *the effect is not produced when the water is allowed to stagnate* and sink down in the soil, but when it is kept in a current over it. When the water is suffered to stagnate, the soil tends to produce *carices, junci, and other subaquatic plants*, but when it is kept in motion, and drained off at intervals, the finest grasses peculiar to the soil and climate are produced. Neither does the fact of the deposition of mud, or other fertilizing sediment, explain the phenomenon; for, however such depositions may increase the effect, it is likewise found that water, without the least perceptible sediment, may be employed with success." (P. 472.)

The Professor proceeds to explain the extent and antiquity of water-meadows in England, especially in the counties of Gloucester and Wilts, and the causes that retard the progress of this valuable practice in Scotland. He adds,—“ Besides the watered meadow properly so called, there is a species of irrigation which deserves the greatest attention where local circumstances are favourable to it. This is when the liquid refuse of towns can be conveyed in drains or sewers to the land. This may be termed a species of liquid manuring rather than irrigating; yet it is found that the principles of the watered meadow, with respect to the mode of distributing and carrying off the water, are as applicable here as when the water is free from perceptible sediment.” (P. 475.)

Endless quotations of the same import might be given from writers on agriculture, some of whom specially applaud the spirit of Mr Miller in expending L.1000 in converting the waste sandy ground called Figget Whins on the sea-shore into an irrigated meadow.—(See the “ Practical Irrigator and Drainer,” by George Stephens.) Reference might be made to France, and to the beautiful neighbourhood of Geneva, and other localities, in which irrigation is abundantly practised around splendid cities and villas; but it is hoped that enough has been said to explain what an irrigated meadow truly is. It seems to be in vain that Mr Black,

bookseller in Edinburgh, has expended capital in the employment of men of learning for the instruction of the public, or that the Highland Society, the Board of Agriculture, and learned professors, labour to diffuse information. The members of our Police Committee and their Chairman *will not read*. They publish a treatise in which about two hundred times they repeat the absurd and false averment that an irrigated meadow is a marsh—a stagnant poisonous marsh—a swamp in which vegetable and animal matter is in a constant state of putrefaction; whereas it has been demonstrated that irrigation is utterly inconsistent with the stagnation of water, or with putrefaction of any sort,—that if putrefaction exist, the whole labour and profit are lost, and instead of gaining thousands by the profit of their meadows, the proprietors would, in this case, incur a large and fruitless expense. The utter ignorance of the framers of this pamphlet is rendered more obvious by the fact that all over England, in places where there are no watered meadows, the practice is to cultivate grass lands by *spreading dung upon them*, which is left to be washed into the soil by the winter rains. It is in this way that the beautiful grass fields, a hundred years old, are preserved in permanent fertility, and in this way the fine natural hay is produced, which is brought to the market of London, and furnished to the finest horses that this world contains. Such a practice, if stated abstractly and not as matter of fact, our Police Committee, or their Chairman, in the fulness of their ignorance, would, no doubt, represent as a cause of universal pestilence. If noxious, it would plainly be incomparably more so than if deposited on a water-meadow, in which the constant flowing of the stream prevents putrefaction.

In the present case, the fact that the irrigated meadows produce profit to their owners, demonstrates that they correspond with the description of that valuable branch of agricultural improvement.

HISTORY OF THE MEADOWS.

History of
the Mea-
dows.

Before proceeding to consider specially the statements in the Police pamphlet, as given by different individuals, and more especially the question how far they affect the health of mankind, it seems proper to give *some* history of these meadows. To the west of the City of Edinburgh, there is a large tract of level land of some miles in extent. It is explained by Dr Combe and others, even in the Police pamphlet, that this level territory was anciently undrained. "Ague made its appearance every spring and autumn a few miles to the westward of Edinburgh, with as much regularity as it still does among the undrained lands of Canada, from the self same cause." The Doctor adds, "The ague has been banished from amongst us chiefly by effective draining of the surface soil." (Page 92.)

About fifty acres of irrigated meadow form part of the territory referred to nearest to Edinburgh, and the irrigation there is of modern introduction. In 1791, Mr Russell, proprietor of Roseburn, attempted to prevent Messrs Haig from casting into a rivulet the refuse of their distillery, whereby to pollute the stream which descended to his lands adjacent to the Water of Leith. He was successful in the Court of Session; but the cause being appealed, the House of Lords, under the advice, it is believed, of Lord Thurlow, Chancellor, "remitted to the Court of Session to investigate whether the water had been pure or contaminated prior to erection of the distillery. This was never done." The result was, that buildings having increased on that side of Edinburgh, the stream was augmented by water brought from the Pentland Hills for the use of the inhabitants, and by the drains. The proprietors of Roseburn and other low grounds, finding they could not protect the purity of the stream, began, after the lapse of years, to use it in forming irrigated meadows. They are not complained of in the Police pamphlet, although much exposed to pub-

lie view, by forming the interval between the two high roads from Glasgow, where they converge towards Edinburgh. It is not pretended that any ague or intermittent fever is produced by these meadows, or that their existence has prevented the construction of the most elegant buildings in Edinburgh towards that quarter, and to within half a mile of them.

With regard to the Meadows on the east, against which the whole vituperation of the Police pamphlet is directed, it is to be observed, that the City of Edinburgh has been compared to the skeleton of a bird. The Castle is the head, the old town with its High Street and lanes on each side, represents the ribs or body of the fowl, and the New Town and Southern Districts represent the wings. But the Cowgate and Grassmarket on the south, and the site of the North Loch, now cultivated, are not well represented by this similitude.—The eastern foul burn is the outlet of all the water descending from the Old Town and a part of the New Town and Southern Districts, including the Grassmarket and Cowgate. Now, it is certain, that in former days the Old Town of Edinburgh was not remarkable for the purity of its streets or lanes, because it had no common sewers, and every sort of soil was cast into the street and lanes every evening, to be removed by scavengers as they best could. They who have read the writings of our countryman Smollett, and of old English travellers, will understand all this, and the meaning of the satirical expression, “the flowers of Edinburgh:” But the whole of this ancient City received effectual purification from the heavy and sudden showers of rain that occasionally fall in our climate, and depart by the foul burn, the ravine of Clockmill, the village of Restalrig, and the lands of Craigentenny, to the sea, about three miles eastward from the City.

In the village of Restalrig, James III. founded a college or fraternity of secular clergy. This college, besides the church, included a “lodging” for the dean, with “chambers” or “manses,” with yards and lands for the prebendaries. At the Reformation, it contained eight prebendaries, besides subordinate officers. Restalrig gave name to a barony, which belonged during many years to pro-

History of
Restalrig.

prietors named Logan, the last of whom was attainted for participation in the Gowrie conspiracy. The barony passed to Lord Balmerino, and on his attainder in 1746 was acquired by the Earl of Moray. The estate of Craigentinny passed through another branch of the Logans to the Nisbets afterwards of Dean, from whom it was acquired by Mr Miller's family.

Villas in Restalrig inhabited by persons of respectability.

In Restalrig, or immediately adjacent to the village, there have at all times existed villas, or ornamental houses or mansions, of considerable value. One of these, styled Marionville, is an elegant villa with a garden extending into the meadow ground. It was, forty years ago, inhabited during a number of years by Captain M'Rae, a man of fortune and fashion. It passed to several respectable persons. Captain Thomas Grindlay purchased it in 1796 for L.1200. Mr Strong, merchant in Leith, bought it in 1800 for L.1400. Mr Scougall, another merchant, bought it for L.2750, and possessed it with his family. He sold it for a very high price (it is believed above L.4000) to Mr Glass. To the east of Marionville is a mansion, erected in 1801 by Mr Scott, on the site of an older residence. It has gardens of considerable extent, and extensive walls. The late Mr Duncan was proprietor of one of the old villas. It was successively occupied by Mr Alexander Tait, writer to the Signet, and a principal clerk of Session, Colonel Fullerton of Fullerton, Sir Archibald Gordon Kinloch, under the medical care and superintendence of Dr William Farquharson, by John Laurensen, Esq. of Invereighty, and by Mr Duncan himself. This last gentleman, being a writer to the Signet, and a practitioner of the law, had the means of trying a legal question at a very trifling expense. He set on foot a litigation in 1804 against the irrigation and the numerous pools for collecting manure, which then existed in his neighbourhood, but which have, all but one, been since filled up. The lawsuit lingered in the Courts till 1809, when it was finally determined. After it had been decided unfavourably to Mr Duncan, he expended L.9000 in rebuilding his house and its appendages. He continued to live there to the age of eighty years, when he died at Restalrig.

The proceedings in Mr Duncan's lawsuit are extremely ^{Mr Duncan's} instructive in relation to the matters which form the sub-^{action in} 1804. ject of the present Police pamphlet. The lawsuit began by a petition to the Sheriff, with concurrence of the Procurator-Fiscal of Court (public prosecutor), presented by Mr Duncan along with John Fletcher, gardener, and a small proprietor in Restalrig; William Scott and James Wright, also proprietors (styled portioners) there; and by George Amos, and some others, described as inhabitants of the village. The petition was directed against William Baird, the Earl of Moray's tenant of Lochend; Louis Cauvin, tenant of the glebe lands; David Reid, gardener in Restalrig; James Hardy Douglas, tenant in Craigentenny; and Robert Wight, tenant in East Mains of Restalrig, or Fillieside Bank. The petition complained that the defenders had "been in the practice of damming up and stopping the aforesaid stream, and even diverting the course of it, and also of making large and deep pits or ponds," &c. The petition prayed the Sheriff to ordain the defenders to fill up the pits or ponds, and "to return the aforesaid stream into its natural channel, and permit the same to run freely in its course to the sea, without hinderance or obstruction," &c.

Answers were lodged to the petition, defending the operations as founded on ancient usage and possession; that the practice produced no detriment to the neighbourhood, and reference was made to the barracks, situated on the declivity above the village. Reference was also made to several decisions in the Courts of Law relative to such matters; but it was specially remarked, that as the question of right affected the proprietors, viz. the Earl of Moray, the Kirk-Session of South Leith, and Mr Miller of Craigentenny, these persons ought to be made parties to the action.

The judicial debate was continued in replies by the petitioners, which made reference to various decisions on questions of nuisance; and farther contending, that the operations being hurtful to human health, no length of time could sanction or render them legal. To get quit of the defence of immemorial possession, the petitioners (pursu-

ers) said—"There were once a set of gentlemen in this country who studied and knew the comforts of life as well as either military physicians or the military themselves—the petitioners mean, the Established Clergy before the Reformation.

"Now, it must be recollected, that the church of Restalrig was first founded by King James III. and afterwards endowed by his successors, James IV. and James V., and that at these times a dignified clergyman had his house in the village of Restalrig, close by where the old church of Restalrig now stands; and it is believed also, some clergy of inferior order had their residence there. It will not probably gain credit, that in these days the operations now complained of existed, or would have been tolerated, and the very fact of the Church and Churchmen having been then there, which probably will not be disputed, affords sufficient evidence, that the works complained of are of much more recent date."

It may be noticed in passing, that this statement is incorrect, as in an Account of the Church Lands confiscated and annexed to the Crown at the Reformation, dated in 1561 (preserved in the Register House at Edinburgh), in specifying those at Restalrig, the Meadows are more than once mentioned; and, in particular, notice is taken "of certain prebendares yardis (gardens), in Restalrig and Chalmeris pertening to the saidis prebendaris, callit ther Mansis and pece of suard Meadow pertaining thereto," &c.

Proof allowed by the Sheriff.

The Sheriff pronounced an interlocutor (12th December 1804), by which he "allows the pursuers a proof of the nuisance complained of, and to the defenders a conjunct probation."

Advocations.

A reclaiming petition was presented, but it was refused by the Sheriff. (Feb. 20. 1805.) The Earl of Moray now came forward and removed the case from the Sheriff-Court to the Court of Session by advocacy, and Louis Cauvin did the same. They were opposed by Messrs Duncan, Scott, and Wright (Fletcher having deserted them), and they continued to endeavour to render their case plausible, by prevailing with George Amos and some other inhabitants of the village, to allow their names to be used.

To obtain the question of right to be finally settled in the most regular and solemn form known in the law of Scotland, recourse was had to an action of declarator in the Court of Session. The pursuers were those (under the exception already mentioned) who had been petitioners to the Sheriff, and the defenders were the same, with the addition of the Earl of Moray, William Henry Miller, Esq. of Craigentenny, and the Rev. Dr Robert Dickson, one of the ministers of South Leith, as owner of the glebe lands, in right of his benefice. The summons was signeted of this date (May 16. 1805), and concludes, that "it OUGHT and SHOULD be found and declared, by decree of their Lordships, that they, the said defenders, nor none of them, have any right or title whatever to divert the stream of water above mentioned from its natural course or channel, nor to dig or make any pits or ponds within the grounds belonging to or possessed by them respectively, for the purpose of gathering or collecting the filth or dung descending from the city of Edinburgh by the aforesaid stream, whereby a nuisance and annoyance is created, highly injurious to the health and comfort of the pursuers and others inhabitants in the village and vicinity of Restalrig, and even to all passengers travelling the road between Leith and Jock's Lodge, and between the village of Restalrig and the said farm called the East Mains of Restalrig, as also the said William Baird, Lewis Cauvin, David Reid, James Hardie Douglas, and Robert Wight, defenders, ought and should be decerned and ordained to remove or fill up the aforesaid pits or ponds already dug by them in the grounds possessed by them respectively, for the purpose of therein collecting the said filth or dung, and to return the aforesaid stream into its natural channel, so far as it has been diverted therefrom by them respectively, AND thereafter to permit the same to run freely in its course to the sea in all time coming, without any hinderance or obstruction on their part; and all and each of them OUGHT and SHOULD be prohibited and discharged from again altering or diverting the said stream from its natural course, and from making or digging any ponds or pits for collecting or stagnating the filth or dung passing thereby in all time

Action of Declarator raised by Duncan and Others.

coming—OR OTHERWISE, it Ought and Should be Found and Declared, by decree foresaid, that the pursuers have legal right to restore the said stream to its natural course or channel, and to remove or fill up the foresaid pits or ponds at the expense of the said five defenders last named, so far as they are within their respective possessions.”²

This action was conjoined with the previous actions of advocacy (12th February 1806), and parties were allowed to state their averments in condescendences. The dispute between the parties resolved into this question of fact, Whether the practice of the defenders, in relation to irrigation and the making of ponds for collecting manure, was hurtful to human health and the safety of the neighbourhood? The relevancy was not disputed, that, if their practice compromised the safety of the inhabitants, it could not be protected against the public interest. Accordingly, it was with a view to that question, that the pursuers had obtained the concurrence of the public prosecutor (Procurator-Fiscal) to their complaint. The parties thus joining issue on the question of injury to the health of the neighbourhood, the Lord Ordinary (Lord Cullen) of this date, (11th March 1806) allowed to both parties a proof. Nearly forty witnesses were examined, and their depositions taken down in writing. The case was afterwards appointed, by the Lord Ordinary, to be argued in written memorials. On considering these, the Lord Ordinary appointed (7th June 1808) cases, styled *informations*, to be printed for the consideration of the Court. The defenders, in their argument, contended, 1. That the practice had existed “from time immemorial of flooding the meadow grounds by means of the foul burn, and of collecting manure in pits and ponds, on all sides of the village of Restalrig, wherever the proprietors and tenants had opportunity of doing it,” that is, found the proceeding practicable.

2. That the principal residences in and near the locality of these operations has been always occupied by respectable families, and occasionally by persons of rank and consequence.

3. They proved, by the testimonies of a cloud of witnesses, the healthiness of the village of Restalrig, and the

Proofs ad-
duced.

Arguments
of the De-
fenders.

mature age to which its inhabitants attain, now as well as in time bygone.

Lastly—laying aside the allegation of unhealthiness, an allegation contrary to the fact—the defenders disputed the relevancy of the subordinate allegations as to disagreeable smell; and, with professional learning, discussed the question of law, how far the pursuers were entitled to complain of inconvenience or discomfort on that score, supposing such to exist.

On this last point much legal argument was maintained, and numerous authorities were quoted, shewing the judicial practice both of England and Scotland. The judgment of the Court of Session was in these terms (9th June 1809):
 “Upon report of Lord Justice Clerk, in place of Lord Cul-
 len, and having advised the Mutual Informations for the
 Parties, The Lords ASSOILZIE the Defenders from the
 whole conclusions of the conjoined actions, and DECERN;
 FIND them entitled to expenses; APPOINT an account there-
 of to be given in, and REMIT to the auditor to tax the
 same and to report.” (Signed) “C. HOPE, *I.P.D.*”

Final judg-
ment.

There can be no better proof that this judgment was well founded, than the fact, that, after its date, Mr Duncan expended the large sum already mentioned in rebuilding his house, in which he lived till he died in a very old age. The Police Committee have improperly alleged that Mr Duncan failed in his action, because *he* had come to the neighbourhood. (P. 8.) But if the defenders had relied with success upon that legal plea, no proof by witnesses would have been necessary, because, from the outset, it was confessed that all the pursuers had come to the neighbourhood, and not it to them. The question sent to proof was, the averment held relevant that the defenders were doing injury to human health; and, accordingly, it was to justify their proceedings in that respect that the proof adduced by the defenders was chiefly or almost entirely directed. By giving minute quotations, the Police Committee have endeavoured to conceal the strength of that proof. (P. 50 to 52.) The defenders will presently shew the import of it, by very full extracts of the statements made on oath by the witnesses for the defence upon which the Court relied. But, what-

ever be the merits of the decree of the Court of Session in the lawsuit with Mr Duncan and others, this is certain, that it became a *final judgment*. It was not appealed from to the House of Lords, and cannot now be appealed from. The parties were competent to try the question. The public prosecutor was in Court, and the private parties were precisely those apparently most interested in the question. The decree, therefore, conclusively fixed the legal right of the defenders in the action; and, while law and justice shall be recognised in the British empire, of that right they cannot be forcibly deprived. For a public purpose, the Legislature might withdraw it, but not without affording ample compensation to the extent of its patrimonial value.

The inhabitants, and the public authorities of Edinburgh, had taken no interest in Mr Duncan's action. It is even believed that its existence was scarcely known except to professional persons; for, as already noticed, few of the inhabitants knew anything of the foul burn—it was not in those days in the view of the public—and nobody troubled or interested themselves concerning it.

Proceedings
posterior to
Mr Duncan's
law-suit.

But, as already remarked, speculative times arrived, and public persons in Edinburgh set on foot these costly undertakings which have involved the community in debt and taxation, and of which undertakings the inhabitants have had leisure to repent. One-half of the Calton Hill was cut down. The road across the burn, by Clockmill, was deserted, though left in existence, and the new elevated and costly road across, or rather along Lord Moray's meadow, was formed. Then followed the Gas-Works; and pedestrians to Portobello by this tract, styled the new London road, complained that this part of their journey was rendered offensive by an odour which they erroneously ascribed to the original foul burn and its contents. Still, the proprietors of the meadow-ground were not disturbed, with this exception, that a private dispute in the Sheriff-Court, in 1817, occurred between Mr Duncan and his tenant on the one part, and Mr Miller of Craigentenny on the other part. By that time Mr Duncan had so totally altered his views and opinions, that he had not only rebuilt

and adorned his costly mansion-house, but let his lands at the high rental produced by irrigation, whereby he was led to dispute Mr Miller's powers over the water. That dispute had no reference to the question of health, which had been set at rest by the Court of Session. The Sheriff, in the new question, pronounced this judgment (29th March 1819): "Finds it instructed that, for a period exceeding the long prescription, the proprietors of Craigentenny have, by their tenants, been in the use, during sundry occasions in every year, and for a certain length of time on each of these occasions, to dam up the water in the burn in question, so as to irrigate their meadows: Finds that in these circumstances the defenders fall now to be maintained in the possession of this right, and therefore recalls the interdict."

In 1829, an application was made to Parliament to authorize the formation of a Railway from the coal-fields, near Dalkeith, to Leith, and also to Edinburgh. The Marquis of Abercorn, and Mr Miller, were unwilling to have the Railway for a neighbour, and made opposition, more especially Mr Miller, chiefly because, by the plan of the work, it was proposed to carry it along his irrigated meadows, at their greatest extension (of above a mile in length), within a short distance of the sea. He suggested a different line, along the upper part of his lands, where the meadow-grass would have been very slightly touched; while, at the same time, it would have proved in every respect more beneficial to the projectors, both physically in point of engineering, and profitably by avoiding payment of the sums awarded in his favour for the damage done to his irrigations. The projectors, however, persisted in their plan; but the scheme was not followed out for some years. The statements of their manager inserted in the Police pamphlet give strong indications of repentance of their own obstinacy.

Railway projected from Dalkeith to Leith.

Next came intelligence of the dreadful effects produced by the cholera in our Indian possessions. Its progress westward was announced—from city to city, and from one province to another, carrying destruction to human life in its train. It reached at length the European cities, and the cold of the north was found to afford no greater

The cholera.—apprehension of it.

safety than had been the result of the tropical heats. It became obvious that, sooner or later, and in a less or greater degree, Britain must encounter this terrible scourge. Preparations were made in Edinburgh by an anxious purification of the city, and more especially of the foul lanes and habitations of the more miserable classes of the inhabitants, including many Irish strangers, who had been led to resort thither by the great public works that had been undertaken in Scotland—the Union Canal, and the expensive operations within and around Edinburgh, styled “improvements.” While the public mind was under excitement by dread of the cholera, some speculative medical gentlemen broached, and loudly proclaimed their opinion, that the irrigated meadows must spread the cholera around them, so as to produce in their vicinity the most fearful desolation, which would extend, by infection, over all the land. The present Police publication informs us, that Dr Barlow attempted to alarm his Majesty’s Government in relation to the military barracks, situated as they are on an eminence that overlooks the meadows. (P. 40.)

Nobody suffered from the cholera in Restalrig.

Well, the Cholera came, and, as already mentioned, Glasgow suffered, Edinburgh suffered, Portobello suffered, Inveresk and Musselburgh suffered grievously, together with various other Scottish towns; but to the astonishment of certain doctors, no doubt, and in utter contempt of all medical science, the inhabitants of *Restalrig*, and their neighbours of the Barracks, and of Jock’s Lodge, remained safe. This explains the statement, by Mr Nairne, in the Police pamphlet (p. 41), that after much alarm from medical reports by men not wiser than some of the present Edinburgh doctors, “*the matter was allowed to drop.*” In other words, the event of the Cholera alarm demonstrated, and ought now to demonstrate, to the public the folly of relying on speculations of medical men in relation to a matter of which it appears they were profoundly ignorant. They are just as ignorant of the nature and effects of agricultural irrigation as they were of the nature of the Cholera, of which they cured nobody.

Police Bill of 1832.

In the mean while, under the excitement from fear of the Cholera, an agitation had been got up by letters and state-

ments in the Edinburgh newspapers, and a bill was brought before Parliament by the Commissioners of Police, which, in section 173, had the marginal title of "Abolition of the Foul Burns." The health of the inhabitants was the pretext. It was proposed, in obscure terms, to place the burns under drains or sewers, and an assessment was proposed for that purpose, "but not for any loss or damage arising to any person or persons whatsoever, for, or on account of the abolition of the said burns in whole or in part, or the deprivation of manure thereby occasioned."

Various projects are known to have been afloat, but all utterly crude. Nobody had calculated the cost of the chief project, a covered drain to the sea; some proposed to make a tunnel to transfer the east foul burn to the Water of Leith, and every project disregarded the vested rights of the owners of the Meadows, and the interest of the town and harbour of Leith. Both were protected by the proprietors of the Meadows, who obtained the following proviso to be added to the clause about making sewers and drains:

—(2 Geo. IV. c. 87, sec. 60), "Provided always, that in making any such main drain or sewer, or conducting drain, the water at present carried into any existing outlet shall not be diverted therefrom." They also obtained the following protecting clause, to be inserted in the General Police Act of 1833 for the burghs of Scotland:—3 and 4 Geo. IV. c. 46, sec. 96, "Provided, nevertheless, that it shall not be lawful for the said Commissioners to cut off, divert, or alter any stream or water-course, or diminish the ancient and accustomed quantity of rain, or other water, or soil flowing therein, at the period at which the provisions of this act may be adopted in any such burgh, without the consent in writing of the persons severally interested in such water, and of the respective owners and occupiers of the land on either side of such stream or water-course throughout their respective properties."

Clause in the
Police Acts
protecting
the irriga-
tion.

Next came the wonderful bill, already mentioned, of 1834, brought into Parliament by the Board of Commissioners of Police of the City of Edinburgh. To prepare for it, there was circulated among the Incorporations, not copies of the bill, but a printed paper styled "Heads of a proposed bill

Police Bill
of 1834.

for watching, cleaning, and lighting the streets of the City of Edinburgh, and adjoining districts; for regulating the police thereof, and other purposes relating thereto;" "and to repeal the existing acts for these purposes." This document was very brief. But it proposed to add to the existing act some extraordinary projects, such as the establishment of a Horse-patrol; that the Commissioners should make and carry on a Gas-work, to purchase buildings to contain two hundred billeted soldiers, and to give the Commissioners power to "*construct tanks, cess-pools, &c. for collecting the manure within the bounds of Police.*" These projects were finally departed from, but in relation to the foul burn, the bill, when prepared, contained two provisions. 1. To include a very considerable portion of Lord Moray's lands of Restalrig within the bounds of the Police. 2. To "make sewers and drains, (sect. 60, act 1832), but making it imperative on proprietors to construct such sewers and drains; and farther, that the Commissioners, when they shall see cause, be empowered to construct *covered drains, sewers, TUNNELS, &c.* to carry foul water, &c. through streets, roads, &c. *to the sea.*"

The Police
Bill a job.

The Commissioners of Police could not fail to be aware that the owners of the irrigated meadows must of necessity come forward before the Committees of Parliament to protect their property against the intended act of spoliation. This foreseen opposition afforded a pretext for sending on excursions to London, members of the Police Board and their friends, as agents and witnesses, at the expense of the community, to support the bill. Accordingly, as already remarked, this beautiful *dung speculation* cost to the inhabitants of Edinburgh above L.4000, and happily terminated in a signal defeat of their Commissioners of Police, the former drain-clause, with its protecting proviso, having been continued.

It deserves notice, that the protecting clauses introduced into the different Police acts were all rendered necessary, and were framed merely because attempts were unjustifiably made, by the aid of legislative power, to violate the rights of private property. The proprietors of the meadows gained nothing that they would not have obtained from

the courts of law : The result of Duncan's action has been seen. The law was sufficiently powerful to protect the public health, but profitable jobs, at the expense of the community, were obtained, whatever fate attended the Police bills.

It might have been presumed that the memorable *dung* speculation and defeat of 1834, would have put an end to such projects. In point of fact, the Commissioners at length became so sensible of the fruitlessness of their attempts to destroy the vested right of the proprietors of the meadow lands, to use the water of the Foul Burn for the purpose of irrigation, that on applying for the next Police Bill (1837), the Commissioners themselves voluntarily inserted in it the protecting clause in favour of the proprietors, which was contained in that of 1834, and made the drain clause of the former act perpetual. But it has been seen that in two years the present agitation has been got up, and being countenanced and industriously fostered by the chairman of a Committee of Police, who has been applauded, set forward, and made a tool of by interested parties, it has matured into the publication in question, and into a new proposal to apply to Parliament against irrigation. In other words, apparently with a view to get into the field of enterprise and expenditure of public money, the plan of proceeding anew to Parliament has been suggested. The public of Edinburgh, however, have now some experience of the cost attending such projects, which uniformly terminate in an augmentation of the city taxes. No doubt, to make the proceeding palatable, it is pretended that this will be done at the national expense. But the nation will not pay the expense of the Police deputation that must proceed to London, or of the multitude of witnesses that must be sent thither, and the liberal fees that must be paid to counsel, solicitors, &c. We are told that the member for Leith has consented to bring in the bill. This is not believed to be true, but, supposing the fact to stand otherwise, the palpable result, under any of the projects hitherto proposed, of turning the foul burn into the Water of Leith, must certainly be to ruin the town and harbour of Leith. Has the ancient hostility of the Managers of Edinburgh against Leith revived? And have the electors of Leith found a

Agitation of
1839.

member *so very liberal*, that he concurs in an attempt to ruin his own constituency to please a Committee of Police of Edinburgh? The conduct of the latter is intelligible. By contract Edinburgh has obtained a special adjustment of its claims against Leith, so it can now afford to leave Leith to its fate, and to rely on the Duke of Buccleugh's new harbour as the efficient harbour of the capital of Scotland.

In the mean while, an event has occurred which must alter entirely, in a short time, the form and nature of the present question. As formerly remarked, the eastern foul burn was never noticed by the general body of the inhabitants of Edinburgh, till the new road by Calton Hill and Jock's Lodge was made across the Earl of Moray's meadow ground, and the Gas-works were established. It was by the materials proceeding from the Gas-works that the waters of the foul burn were altered and made to give forth that offensive odour which afforded the pretext for the present agitation, and was, in truth, the cause of any interest which it excited. But a new state of matters approaches. During the present Session of Parliament, 1840, two private Bills were brought forward, and statutes have been obtained in consequence of them. [3 Vict.] The one act incorporates a number of persons to form a new Gas Company for Edinburgh and Leith. The other statute has been obtained by the Edinburgh Gas-Light Company, for the purpose of altering and enlarging their powers. This last is the Company whose gas manufactory, established in the Canongate, has poured into the common-sewer and feeders of the eastern foul burn, those washings, &c. which have rendered its waters offensive, either in the ordinary stream, or when spread over the meadow ground for irrigation. As formerly stated, if the Commissioners of Police had done their duty, this proceeding on the part of the Gas Company might have been prevented; but matters are now placed on a safer footing. By section 18, it is enacted, "That if the said Edinburgh Gas-Light Company, or any body or bodies politic or corporate, or person or persons whomsoever, making, furnishing, or supplying any gas used, burnt, or consumed within the limits of the said recited acts and this act, shall, at any time, from and after the passing of this act, empty, drain, conduct, or convey, or cause or suffer to be emptied, drained, conducted

or conveyed, or to run or flow any washings or other waste liquids, or any noisome or offensive liquids, substances, or things whatsoever, which shall arise or be produced in the prosecution of any gas-works, or in the manufacture or process of making or procuring gas, into any river, brook, running stream (*including the run of water which proceeds from the City of Edinburgh to the sea by the village of Restalrig*), reservoir, canal, aqueduct, waterway, feeder, pond, springhead, or well, or *into any drain, sewer, or ditch communicating therewith*, or do, or cause to be done, any other annoyance, act, or thing to the water contained in any such river, brook, or running stream, reservoir, canal, aqueduct, waterway, feeder, pond or springhead, well, drain, sewer, or ditch, whereby the water or any part thereof, shall or may be soiled or otherwise affected, then, and in every such case, the said Company, or other person or persons as aforesaid, shall forfeit and pay for every such offence the sum of L.200, and such penalty or forfeiture shall and may be sued for and recovered, together with full costs of suit, before any Court competent within Scotland, and the whole thereof shall be paid to the person or persons who shall enforce or sue for the same." A farther penalty is enacted of L.20 per day during which the offensive proceedings shall continue after intimation.

Similar provisions are inserted in the New Leith Gas act. (3 Vict. § 61.) But the Edinburgh Gas Company complained that, having been so long permitted to transmit their washings &c. into the foul burn, they ought to be allowed some time to prepare for the change. Accordingly, they obtained the indulgence specified in the 19th clause of the statute, which is thus expressed, ' And whereas, since the establishment of the said Edinburgh Gas Light Company, *the said run of water which proceeds from the City of Edinburgh to the sea by the village of Restalrig*, has been used as a drain or sewer for the conveyance of the refuse from the works of the said Company, be it therefore farther enacted, That the restrictions, penalties, and forfeitures herein before contained, in regard to the use of the said run of water, shall not come into operation against the said Com-

pany until the expiration of *six calendar months* from and after the passing of this act.”—*i. e.* 23d March 1840.

How the Edinburgh Gas Company are to manage their matters under this statute, it is unnecessary here to inquire. The London Gas Companies are, in like manner, prohibited from defiling the river Thames by the refuse of their works. It is fortunate for Edinburgh, that the enforcement of the law is no longer entrusted to the Police Board exclusively. In the mean while, it is to be kept in view, that a legislative provision has been made for obviating the chief and clamorous grounds of complaint in the Police pamphlet. What is to be farther here stated, has two objects in view; *1st*, To shew that the irrigated meadows, as such, are not injurious to health, and, *2d*, That the produce of them is valuable to the community.

The pretext of the Police Committee for an application to Parliament once more, is, the health of the inhabitants as injured by irrigation. Because fever has augmented in Edinburgh and Glasgow during two or three years, the irrigation is to blame, although at Glasgow there is no irrigation. The pretext of health might, with persons ignorant of the nature of agricultural irrigation, be excusable in 1831, when the dread of that approaching pestilence the Cholera hung over the nation; but after what then occurred, and when a consciousness of the absurdity of that fear has been demonstrated by the *dung* speculation of 1834, it truly requires much indulgence and extreme candour to believe that, on the part of the Police Committee or their chairman, the present agitation was honestly got up and patronised. The best that can be said for it is, that it has been the result of ignorance, pure ignorance, so unseemly on the part of persons putting themselves forward as qualified to administer any part of the general affairs of a great community.

Question of
Health.

But to put an end, if possible, to such projects, the question, How far the irrigated meadows are hurtful to human health? shall here be considered, upon evidence stated which has either been already judicially adduced, or is ready to be brought forward.

EVIDENCE ON THE QUESTION HOW FAR THE USE MADE OF
THE FOUL BURN IS HURTFUL TO THE HEALTH OF THE
NEIGHBOURHOOD.

The explanation already given of the nature of agricultural irrigation, and the extent in which it is elsewhere safely practised, must, with all men of sense, decide the question. The irrigated meadows, more especially those to the eastward of Edinburgh, now challenge examination by any skilful agriculturist. No marsh or undrained ground there exists. No coarse or *semi-aquatic* plants are to be found. The finest grasses prevail; and the largest portion of the irrigated ground, being that adjacent to the sea, distant about four miles from the Cross of Edinburgh, and three miles from the Palace and the Canongate, is land which, in its natural state, consists of mere sand, or bents or downs, incapable of holding or detaining water for an instant. The grass which now covers these fields of sand is totally the product of the running stream. The grass plants have no roots above an inch and a half in depth, being no more than sufficient to uphold them against the scythe of the mower.

But the fact, as already noticed, was investigated judicially in Mr Duncan's action, and ascertained from the mouths of witnesses upon oath. As already remarked, very full extracts shall here be given from the proof led in that case by the defenders in the action.

The first witness examined for the defenders, 'was Thomas
' Nicolson, labourer at Lochend, *aged seventy-five in Novem-*
' *ber last*" (1805), "who being solemnly sworn, &c. and exa-
' mined, depones, That he knows some pits or ponds in
' the valley between Clockmill Bridge and the village of
' Restalrig; and he knew one of these pits there between
' forty-six and fifty years past: That the pit he alludes to
' was at the bottom of Jock's Lodge Loan: That the
' other pits have been there for some considerable time,
' but how long he cannot specify: That he has wrought
' several summers at some of these pits, in cleaning them

Proof, dated
5th Novem-
ber 1806.

out, and the last time he wrought at them was about eight
 or nine years ago; but he does not know how many years
 ago it is since he first began to work at them, only he can say
 that it is not twenty years ago: *That, while he was work-*
ing at these ponds, he never felt any odds in the state of his
health: That he has many a time wrought for weeks to-
 gether at these ponds: That he was residing in the vil-
 lage of Restalrig when he first knew the ponds; *and he con-*
tinued to reside there for twenty years: That, *while he con-*
tinued in Restalrig, his family consisted of himself, his
wife, and three children: and his family kept their health
 as well when he *staid at Restalrig, as when he lived else-*
where; and his wife is still alive, and near about his own
 age, or within two years of it. Depones, That he has ne-
 ver seen the foul burn diverted from its course by Mr
 Baird, or any of the tenants, for the purpose of water-
 ing the meadow; but, on the question being more par-
 ticularly put and explained to the witness, he depones,
That he has himself assisted to cut a stripe from the burn,
for watering the meadow; but he never saw the whole wa-
ter diverted for that purpose. Depones, That it was Mr
 Baird who employed the witness to clear out the ponds be-
 fore mentioned: That he has also wrought at other ponds
 at Craigentenny, under the employment of Mr James
 Mason, residing at Portobello: That these last-mentioned
 ponds were about thirty or forty yards from the house
 of Craigentenny. Depones, That he knew several ponds
 in the *Abbeyhill, on the west side of Croftangry (Croft-*
an-right), which is the lane leading from the Abbeyhill
 to St Ann's Yard, *and belonging to Mr Alston.* Interro-
 gated for the pursuers, depones, *That he has resided at his*
present house at Lochend above twenty years, and he is te-
 nant to Mr Baird, one of the defenders, and he is re-
 movable at pleasure: That the pond at the bottom of
 Jock's Lodge Loan, formerly mentioned, is now filled up,
 and it is twenty years since it was filled up: That this
 pond was on Mr Baird's farm: That it is some time
 ago since the ponds at Croftangry were filled up, and
 the ground is now built upon: That Colonel Mackay, as

‘ he thinks, was living in the house of Craigentenny when
 ‘ the deponent wrought at the ponds on that property, and
 ‘ at that time Mr Scott was proprietor of the estate : That
 ‘ when the deponent wrought at the different ponds before
 ‘ mentioned, he did not receive any extraordinary wages,
 ‘ but just the ordinary wages of the country : That when
 ‘ the witness wrought at the ponds, he was not sensible of
 ‘ any worse smell than when he resides at his present
 ‘ house : *That the work was heavy and dirty* ; but for any
 ‘ thing else he could have wrought at it all his days : That
 ‘ he remembers of Mr Archibald Hart living in the house
 ‘ of Craigentenny, and this was after Colonel Mackay
 ‘ had left it : That he also *remembers of Governor Home’s*
 ‘ *family living* in that house, and this was also after Colonel
 ‘ Mackay had left it, though he does not remember the
 ‘ precise time. All which is truth,’ &c.

‘ James Bell, labouring servant to Mr Baird, one of the
 ‘ defenders, aged sixty and upwards, who being sworn *ut*
 ‘ *supra*, depones, That he has been servant to Mr Baird
 ‘ and his father at Lochend for upwards of *forty years* :
 ‘ That he knows several pits on Mr Baird’s farm, near the
 ‘ foul burn, for collecting dung, and they are situated be-
 ‘ tween Clockmill Bridge and Restalrig : That he knew
 ‘ two ponds at the foot of Jock’s Lodge Loan, which *were*
 ‘ *there forty-five years ago* ; but they are now filled up :
 ‘ That he wrought at these two ponds at different times
 ‘ during a period of two years : the first time these two
 ‘ ponds were cleared out by Mr Baird’s father, the deponent,
 ‘ assisted to clean them out : That he knows Mr Ronald
 ‘ Crawford at Restalrig, had these ponds several years be-
 ‘ fore : That he has also wrought at the other ponds which
 ‘ are on Mr Baird’s farm, and it is about twenty-five or
 ‘ twenty-six years since he first began to work at them,
 ‘ and he has wrought during several years at these ponds :
 ‘ *That he never knew his health affected from working at these*
 ‘ *ponds* : That he was a hired servant to Mr Baird, and
 ‘ received regular wages, and he received nothing extra
 ‘ when he wrought at these ponds : That the deponent, by
 ‘ order of Mr Baird, has almost every year, and *sometimes*

' twice in the year, carried stripes from the foul burn for the
 ' purpose of watering the meadow ground: That this was
 ' done also in the time of Mr Baird's father: That there is
 ' a sluice or dam-head at the head of Mr Baird's meadow
 ' near Clockmill Bridge, and on the march between Sir
 ' James Montgomery's ponds and Mr Baird's ground ;
 ' and the purpose of this sluice is to carry the water to any
 ' part of Mr Baird's meadow, that he has occasion for ;
 ' and this sluice existed long before the deponent went to
 ' be a servant to Mr Baird's father; but how long before
 ' that he does not know: That, when there was occasion
 ' for it, the water was carried over the whole surface of the
 ' meadow as well as into the ponds: That Sir James
 ' Montgomery has also a sluice further up the burn; but
 ' how long it has been there the deponent cannot specify :
 ' That Sir James's ponds may have been there about *thirty*
 ' years, but he cannot be positive as to the precise time :
 ' That Mr Baron Norton had a pond upon his own ground,
 ' but Mr Montgomery stopt it, by which the deponent means that
 ' he would not allow the water to run into it, but took it to his
 ' own ground: That he has seen this pond cleaned out by
 ' Mr Veitch, the tenant of the ground under Mr Baron
 ' Norton, who was then proprietor of the ground. Inter-
 ' rogated for the pursuers, depones, That he thinks it was
 ' in the year 1783, that the two ponds at the foot of Jock's
 ' Lodge loan were filled up. Depones, That he himself knows
 ' the fact, that these two ponds were possessed by Mr
 ' Ronald Crawford before Mr Baird's father resumed the
 ' possession of the ground, and they were first formed by Mr
 ' Ronald Crawford: That Mr Ronald Crawford had posses-
 ' sion of these pits down to his death; but the deponent does
 ' not remember when that happened: That he never knew
 ' the whole of the meadows covered with water from the burn
 ' at one and the same time. Re-interrogated for the defen-
 ' ders, depones, That, before he went into the service of
 ' Mr Baird's father, he had been a servant to Mrs Pew at
 ' Leith Links, and also to Mr Alston at Upper Quarry-
 ' holes; and all this is truth, &c. Depones he cannot
 ' write.'

‘ George Crabb (or Craib) gardener, residing in Leith,
 ‘ aged seventy-three, sworn, *ut supra*, depones, *That about*
 ‘ *fifty years ago he entered into the service of Mr Ronald Craw-*
 ‘ *ford at Restalrig, as gardener and griever : That, during the*
 ‘ *first four years, he lived in Mr Crawford’s house, and af-*
 ‘ *ter that he married and went to reside in a house on the*
 ‘ *ground now occupied by Piershill Barracks, in which he*
 ‘ *lived about two years, and he next went to a house in Restal-*
 ‘ *rig, nearly opposite to the old church, in which he resided about*
 ‘ *six or seven years : That during all this time he remained*
 ‘ *in Mr Crawford’s service : That he was in Mr Craw-*
 ‘ *ford’s service for ten years in all, and upon his death he*
 ‘ *continued in the service of his family for four years : That*
 ‘ *after leaving Mr Crawford’s family, the deponent went into*
 ‘ *the possession of the house and garden in Restalrig, which*
 ‘ *is now the property of Mr Fletcher, one of the pursuers,*
 ‘ *and he possessed the same for seven years : That after this*
 ‘ *he had a house in Restalrig from Mr Telford, situated*
 ‘ *nearly opposite the old church, and which he possessed for*
 ‘ *about three years : That after leaving that house, the de-*
 ‘ *ponent went into the service of Mr Robert Horne, farmer*
 ‘ *at Filliesidebank, in the service of whom and his widow he*
 ‘ *continued till their deaths : That the widow was succeeded in*
 ‘ *the farm by her nephew, Mr Wight, and the deponent con-*
 ‘ *tinued with him, and is still in his service : That during the*
 ‘ *first twenty years he was in the service of Mr Horne’s*
 ‘ *family, he resided in a house in the village of Restalrig,*
 ‘ *which is opposite to Craigentinny gate upon the west, and since*
 ‘ *he left that house he has resided at Leith. Depones, That he*
 ‘ *knows several ponds in the valley west of Restalrig : That*
 ‘ *about forty years ago the deponent, by the orders of his master,*
 ‘ *Mr Crawford, assisted to make a pond at the bottom of Jock’s*
 ‘ *Lodge Loan : That the ground was part of the farm belong-*
 ‘ *ing to the present Mr Baird’s father, which was subset*
 ‘ *by him to David Lawson, smith in Restalrig, who per-*
 ‘ *mitted Mr Crawford to make the pond : That at the time*
 ‘ *the deponent made this pond, he was then residing in Mr*
 ‘ *Crawford’s house, and was not then married : That he*
 ‘ *assisted several times to clean out this pond during Mr*

‘ Crawford’s lifetime, and upon his death it was filled up,
 ‘ the banks being thrown into it; by assisting to clean it
 ‘ out, he means to say he acted as overseer to the work-
 ‘ men. Depones, That he remembers a pond, about fifty
 ‘ years ago, near Clockmill Bridge, on the ground now be-
 ‘ longing to Sir James Montgomery, and which was made
 ‘ by Mr Butchart, as he thinks; and the deponent pur-
 ‘ chased dung out of it for the use of a field belonging to
 ‘ Mr Crawford’s family, and this was after that gentleman’s
 ‘ death. Depones, That he had the sole charge of making
 ‘ the ponds which are on Mr Yule’s ground, which lie a
 ‘ little way from Craigentenny House, and this was about
 ‘ forty years ago that they were formed; and the deponent
 ‘ acted under the orders of his master, Mr Ronald Craw-
 ‘ ford, who was then proprietor of the ground: That in a
 ‘ line with these last-mentioned ponds, and to the north of
 ‘ them there was another pond, which belonged to Mr
 ‘ Henry Baird, and afterwards came into the possession
 ‘ of Mr Horne: That this pond could hardly be said to
 ‘ be formed by any body, but being hollow ground, was in
 ‘ a manner formed by nature: That the deponent has
 ‘ seen dung taken out of all these ponds almost every year,
 ‘ and particularly he has seen Henry Baird take dung out
 ‘ of his pond; and he has seen *Mr Horne take out dung out*
 ‘ *of the same pond* after it came into his possession: That
 ‘ Mr Henry Baird’s pond, which is now on Mr Wight’s
 ‘ farm, was some time ago filled up by Mr Wight, who threw
 ‘ rubbish into it: That Mr Hardy Douglas, the present
 ‘ tenant of Craigentenny House, has a pond measuring
 ‘ twenty-seven falls and a half, which is situated in a bit of
 ‘ meadow-ground a little way to the east of Craigentenny
 ‘ House: That the deponent has seen dung taken out of
 ‘ ditches and water-courses on the south side of Croftangry,
 ‘ but he does not remember of any ponds there. Depones,
 ‘ That he paid the workmen who cleaned out Mr Craw-
 ‘ ford’s ponds, and they received the ordinary wages of the
 ‘ country, but they got over and above some spirits: *That*
 ‘ *the deponent never heard any of them complain of bad health*
 ‘ *from the work: That he brought up a family of six sons*

‘ while he resided at Restalrig, and they, as well as his wife, were very healthy ; and the deponent himself likewise kept his health very well while residing there : Interrogated for the pursuers, depones, That he has known Mrs Horne take dung out of the pond which belonged to her husband ; and, as near as the witness can specify, it is about ten years since dung was last taken out of it. All which is truth,’ &c.

‘ Henry Baird, salt-officer, residing at Fisherrow, aged seventy years and upwards, sworn, *ut supra*, depones, That he is cousin-german to Mr Baird, one of the defenders : That he resided in the village of Restalrig from the year 1748 to the year 1760, and during that time, acted as overseer on his father’s farm, which was part of the Craigentinny estate, and which was situated between Mr Yule’s property and the farm now possessed by Mr David Horne. Depones, That there were ponds on the ground, to the eastward of Restalrig, and opposite to Craigentinny House : That one of these ponds was there during the lifetime of the deponent’s grandfather, which the deponent had occasion to know, by his coming and going to his grandfather’s before he went to reside in the village : That he also remembers two ponds which were upon the ground, now belonging to Mr Yule, upon which the deponent has skaited when he was a boy, and this was before he went to reside in the village : That there were two other ponds farther east which were made by Mr Ronald Crawford, about the year 1756 or 1757 : That, at the time the deponent skaited upon the two ponds above mentioned, no dung was collected in them ; but there was dung collected and taken out of the ponds which had been made by Mr Crawford : That dung was also collected and taken out of the pond which was next to Craigentinny House. Depones, That about the year 1756 or 1757, and the deponent is sure it was several years before he left the village, Mr Ronald Crawford made two ponds, as he thinks, on the meadow ground at the bottom of Jock’s Lodge Loan : That these ponds were made on the farm belonging to the deceased Mr Baird,

whose wife was the deponent's aunt, that part of which
 had been subset by Mr Baird to David Lawson, black-
 smith in Restalrig, and who, on Mr Crawford's sugges-
 tion, got a tack of it for several years; after obtaining
 which, Mr Crawford got a subset from Lawson, and then
 made these two ponds; and the deponent heard Mr Baird
 say, that he wished to prevent Mr Crawford from mak-
 ing these ponds, as they would carry off the dung from
 the farm: That the deponent has seen these ponds cleaned
 out many a time, and Mr Crawford had carts made of a
 particular construction for carrying away the dung to
 his grounds, as it was taken away before it was dry, and
 Mr Crawford continued to use these ponds, at least dur-
 ing the whole time the deponent resided at Restalrig.
 Depones, That he remembers a pond on the ground at
 Abbeyhill, now occupied by Mr Gowans' marble-work
 and Mr Brown's coach-yard, which belonged to Baron
 Muir, and who took the dung out of it and carried it to
 the Links of Portobello belonging to him; but he can-
 not be positive whether this was before or after the year
 1760. Depones, While he resided at Restalrig, his uncle
 Mr Baird collected dung at the dam-head, east of Clock-
 mill Bridge, and which is upon his own farm, but there
 were then no ponds there, so far as he recollects; but
 there have been ponds made there since, but at what par-
 ticular period he does not know: That the late Mr Baird,
 the defender's father, *came to his farm in the year 1738,*
 and the deponent was occasionally going and coming to
 it; and as far back as the deponent remembers, Mr Baird
had a sluice or dam-head upon the foul burn, at the west
end of the meadow, for the purpose of letting the water
down to water his part of the meadow: That the deponent
has seen Mr Baird water his meadow very often from the
burn, by means of this sluice: That he has not resided in
 Restalrig or its vicinity, since the year 1760. Depones,
 That it was the practice of his grandfather, and of his fa-
 ther, and also of his uncle Mr Baird, and himself, to take
 off every season the surface of part of their meadow-
 ground to the depth of a spade or two: and, by letting

‘ in the burn upon it, the ground was filled up by the next
 ‘ season, so as to supply the place of the soil taken off, and
 ‘ the surface so taken off was employed for making composts
 ‘ for the farm. Interrogated for the pursuers, depones,
 ‘ That, while he resided in Restalrig, he lived in a house
 ‘ opposite to the door of Craigentinny garden : That he
 ‘ does not know whether the ponds which were in his fa-
 ‘ ther’s farm still exist or not, as he has not been there for
 ‘ a number of years : That there is now grass growing on
 ‘ the ground where the ponds were at the bottom of Jock’s
 ‘ Lodge Loan. Depones, That he knows Mr Baird, the
 ‘ defender, has some ponds on his farm ; but he cannot say
 ‘ when they were first formed, and he does not think they
 ‘ were in existence when he left Restalrig in the year 1760.
 ‘ Depones, That there is a pond on the meadow-ground to
 ‘ the west of the church, and which has been there about
 ‘ forty years ; but whether more or less he cannot recollect.
 ‘ Re-interrogated for the defenders, depones, *That he kept*
 ‘ *his health very well when he resided in Restalrig* : That
 ‘ his grandfather resided in the same house which the de-
 ‘ ponent afterwards possessed, on the south-side of Craigh-
 ‘ entinny garden, and which was then the eastmost dwell-
 ‘ ing-house in Restalrig : That when the deponent came to
 ‘ this house, his grandfather went to Jock’s Lodge : That
 ‘ his grandfather came to reside in Restalrig in the year
 ‘ 1729, *and continued there till the year 1748*, being the
 ‘ currency of a nineteen years’ lease which he had, and
 ‘ died at the age of *eighty-one* : That the deponent’s father
 ‘ did not reside at Restalrig, but at some miles distant
 ‘ from it ; and all which is truth,’ &c.

‘ Archibald Hair, gardener at St Margaret’s Well, which
 ‘ is on Mr Baird’s farm, aged fifty years, sworn, *ut supra*, de-
 ‘ pones, That the house in which he resides is upon *the very*
 ‘ *edge of Mr Baird’s meadow*, and he has resided in that, and
 ‘ in an adjoining house, for about fourteen years in whole :
 ‘ That he has a wife and six children, four of whom were born
 ‘ since he came to reside there : That his eldest child
 ‘ is seventeen years old and upwards, and has lived with
 ‘ him ever since he resided at St Margaret’s Well ; That *he*

‘ *and his family have been very healthy since they went to reside there, with the exception of the small-pox and other children’s diseases: That after he had resided for three or four years at St Margaret’s Well, his family and he went to reside in the village of Restalrig, in a house opposite to the Old Kirk, where they were two years, and from that returned to St Margaret’s Well: That during these two years his family were equally healthy.* Depones, ‘ *There are ponds in the meadow to the north of his house, and he has been employed different years working in the ponds, and for months together at a time: That he kept his health equally well as when he was employed at any other work, and he received no extraordinary wages when he was working at these ponds. Depones, That he has assisted many times to turn the foul burn upon the meadow as often as it was required, and in all directions that was necessary; and he has done so both for Mr Baird and for his sub-tenants,’ &c.*

‘ *Marcus Calder, labourer, residing at St Margaret’s Well, aged fifty-one years, sworn, ut supra, depones, That he is subtenant of a house, garden, and St Margaret’s Well, under Mr Baird, and at last Martinmas he obtained a verbal lease of them from Mr Baird for three years. Depones, That his house is situated on the edge of Mr Baird’s meadows, and upon the ground of it: That he has resided in it for four years past last Whitsunday: That he has a wife and five children, the eldest of whom is going seventeen years of age, and all of whom have resided with him since he came to St Margaret’s Well; and the deponent as well as his family have kept their health there as well as ever they did.* Depones, ‘ *That he knows there are ponds in the meadows and in the neighbourhood, and he has emptied these ponds for the last nine years running: That he first emptied a pond belonging to Mr Yule, which lies to the east or south-east of Craigentinny House, and which he emptied for three seasons running: That, thereafter, he emptied a pond for Mr Baird three different years: That there are two ponds upon Sir James Montgomery’s ground at the top of the*

‘ meadow, and one of these he emptied one year, and he
 ‘ emptied both of them for two years running ; and these
 ‘ ponds belonged to Mr Johnston, who had them from
 ‘ John Brown : That in one of the years he emptied Mr
 ‘ Baird’s pond, he also emptied one for Mr Cauvin, which
 ‘ is on the north-west side of Restalrig church-yard : That
 ‘ *he kept his health when he was employed in that work as well*
 ‘ *as he ever did at any other* : That he has been employed
 ‘ for *five weeks* together in cleaning out one man’s ponds,
 ‘ and he has perhaps wrought *eight weeks* at this work in
 ‘ one season. Depones, That he knows Mr Baird, as well
 ‘ as the other tenants of the meadow, *are in the practice*
 ‘ *of watering it from the foul burn in all directions, and as*
 ‘ *often as they find occasion.* Depones, That Sir James
 ‘ Montgomery has a sluice on the burn for letting the wa-
 ‘ ter into his ponds, and after the ponds are filled, the
 ‘ water is returned into the stream of the foul burn, above
 ‘ Mr Baird’s sluice : That Sir James Montgomery, or John
 ‘ Brown his tenant, is in the practice of taking off the
 ‘ burn at the bridge, and leading it down all the way in a
 ‘ ditch, *for the purpose of watering his meadow-ground,*
 ‘ *which extends down to the back of the deponent’s dwelling-*
 ‘ *house* : That where there is little water in the burn, the
 ‘ whole of it is carried to water the meadow as before
 ‘ mentioned on both sides.’

‘ Barbara Isleman, residenter in Restalrig, aged *eighty*
 ‘ *years*, who being solemnly sworn, &c., depones, That she
 ‘ has resided in Restalrig above *thirty years*, and has been
 ‘ above eight years in her present house, which is near to
 ‘ the ponds to the west of the road, leading from Jock’s
 ‘ Lodge loan to Leith. Depones, *That she has always kept*
 ‘ *her health well, and never felt any injury from residing near*
 ‘ *these ponds.* All this is truth,’ &c.

‘ David Gilchrist, labourer, residing in Restalrig, aged
 ‘ *seventy-eight years*, who being solemnly sworn, &c., depones,
 ‘ That he was *thirty-three years* servant to Robert Horne,
 ‘ tenant in the farm-house, possessed by Mr Wight :
 ‘ That Robert Horne had a pit or pond on the east side
 ‘ of Craigentenny-house, and the deponent has often been
 ‘ employed to assist in clearing it out, *but never found*

‘ *his health any ways affected by the work.* Depones, That
 ‘ he was employed in this work every season while Robert
 ‘ Horne lived, which might be about twelve years, but he
 ‘ was very little employed after his death: That since Mr
 ‘ Horne’s death, the deponent has resided with his son in
 ‘ a house opposite to the church-yard door in Restalrig :
 ‘ That Mr Cauvin has three pits in the neighbourhood,
 ‘ and he (the deponent) *never felt his health affected by them.*
 ‘ All this is truth,’ &c.,

‘ Walter Ballantyne, residing at Mr Crokot’s brickfield,
 ‘ between Restalrig and Leith, aged 47 years, sworn *ut*
 ‘ *supra*, depones, That Mr Baird has some ponds on his
 ‘ meadow to the west of the village of Restalrig, and in
 ‘ the years 1803 and 1804, the deponent assisted to clean
 ‘ out two of these ponds: That this was in the summer
 ‘ time, and he wrought for about five or six weeks each
 ‘ time: That after the manure was taken out of the ponds,
 ‘ it was laid down on the adjoining ground till carted
 ‘ away: That the deponent *felt his health equally good when*
 ‘ *employed at this work, as when he wrought at any other :*
 ‘ That he has assisted for two summers *to water Mr*
 ‘ *Baird’s meadow, by turning the foul burn in upon it, and*
 ‘ *he took as much water from the burn as was sufficient*
 ‘ *to water the meadow properly :* That he has seen John
 ‘ Brown watering his part of the meadow *by the same means,*
 ‘ and John Brown is tenant of Sir James Montgomery.
 ‘ Interrogated for the pursuer, depones, That the first
 ‘ year he cleaned out Mr Baird’s ponds he was residing
 ‘ at Restalrig, where he lived five years, and the second
 ‘ time he was living in his present house: That the wages
 ‘ the witness received for working at the ponds were not
 ‘ higher than what were commonly given for other work
 ‘ to labourers: That the house in Restalrig possessed by
 ‘ the witness, was opposite the churchyard, on the east
 ‘ side of the street, *and his wife and three children all kept*
 ‘ *their healths well there, as did the deponent.* And all this
 ‘ is truth,’ &c.

Proof, dated
 24th Janu-
 ary 1807.

‘ William Farquharson, physician in Edinburgh, aged
 ‘ 50 and upwards, who being solemnly sworn, *ut supra*, de-
 ‘ pones, That he resided in the house now belonging to Mr

‘ Duncan the pursuer, at Restalrig, from the month of
 ‘ June or July 1795 to the following month of April: That
 ‘ the house was taken for Sir Archibald Gordon Kinloch’s
 ‘ use, who was under the charge of the deponent. De-
 ‘ pones, That he knows the ponds in the neighbourhood of
 ‘ Restalrig, and sometimes in warm weather, when on the
 ‘ grounds to the south of the house, the deponent was sen-
 ‘ sible of an offensive smell from the ponds; and at this
 ‘ time there were small ponds to the south of the house in
 ‘ the grounds, and Reid the gardener, to whom these ponds
 ‘ belonged, collected manure in them, and was accustomed
 ‘ to take the manure out of the pits and lay it upon the
 ‘ banks for sale: That the deponent and Sir Archibald
 ‘ were often accustomed to be in the grounds to the north
 ‘ of the house: That the deponent does not recollect po-
 ‘ sitively that he was sensible of the smell when there,
 ‘ though he thinks it probable he might be sensible of it,
 ‘ but he is sure Sir Archibald never complained of it; on
 ‘ the contrary, he was very unwilling to leave the place:
 ‘ That Sir Archibald was very acute in his sense of smell-
 ‘ ing, and uncommonly delicate with regard to cleanliness:
 ‘ That the deponent can say nothing as to his recollec-
 ‘ tion whether he was sensible of the smell when in the
 ‘ house: *That both the deponent and Sir Archibald enjoyed*
 ‘ *their health as well as ever they did, while residing at Res-*
 ‘ *talrig, and had the deponent considered the smell as any*
 ‘ *ways prejudicial to health, he would have felt it his duty*
 ‘ *to have communicated that circumstance to Sir Archibald’s*
 ‘ *trustees*: That the deponent, and Dr James Hume,
 ‘ physician in Edinburgh, and Sir Forster Cunliff, Sir
 ‘ Archibald’s brother-in-law, who were two of his trustees,
 ‘ looked at several places before fixing on Restalrig for
 ‘ Sir Archibald, and they repeatedly inspected Restalrig
 ‘ before fixing on it; but it was principally the house
 ‘ they inspected, and the deponent and Dr Hume were
 ‘ satisfied that if the house suited and was free from
 ‘ damp, *there was no risk* to be apprehended from the
 ‘ ponds: That Dr Hume, as well as his father Dr Fran-
 ‘ cis Hume, were repeatedly at Restalrig while the de-

'ponent lived there, visiting in the house. Depones,
 ' That neither Dr Hume nor his father ever suggested
 ' to the deponent that Sir Archibald ought to be re-
 ' moved from Restalrig on account of the ponds: That this
 ' house was only taken as a temporary residence for Sir
 ' Archibald, till one at a greater distance from the town
 ' should be procured: That the two Dr Humes did not
 ' visit Sir Archibald as professional men: That Sir Archi-
 ' bald was under the charge of the deponent from the
 ' month of May 1795 to the month of October 1800, when
 ' he died at Greenlaw House: That, while residing at
 ' Restalrig, the deponent was in use to visit gratuitously
 ' any poor person in the village who might want his ad-
 ' vice: That the deponent does *not recollect of any com-*
 ' *plaint in the village while he resided there, which appear-*
 ' *ed to him to have been occasioned by the exhalations from*
 ' *the ponds*: That the deponent knows there is great dif-
 ' ference of opinion amongst medical men respecting the
 ' effects upon health of those living in the neighbourhood
 ' of such ponds, and the deponent himself is firmly of
 ' opinion that very little detriment can arise from resid-
 ' ing in the neighbourhood of such ponds; and the wit-
 ' ness adds, *that the most delicate child he ever had was*
 ' *about ten months old when the deponent went to reside at*
 ' *Restalrig, and he did not suffer in point of health from*
 ' *his residing there, and this child got stout while there*. In-
 ' terrogated for the pursuer, depones, That, from the
 ' distance between the court in the front of the house of
 ' Restalrig, and the ponds to the south, he thinks it
 ' likely, that he might have been sensible of the smell
 ' when in the court: That he does not remember the names
 ' of any of the sick persons he visited in the village. De-
 ' pones, That there was a pond close on the roadside on
 ' the right hand in going from the village to Jock's Lodge:
 ' That, in passing this pond, the deponent was sometimes
 ' sensible of an offensive smell proceeding from it: That
 ' this pond is very near the village. Interrogated, If the
 ' deponent had a patient in Edinburgh who was delicate,
 ' and required country air, Whether he would recommend

‘ the village of Restalrig as a proper place for him ? depones, That most likely he would not ; for though the deponent *is decidedly of opinion* that a delicate person would recover there as well as any where else, yet, on account of the difference of opinion among his brethren respecting a situation in the neighbourhood of such ponds, he would not recommend his patient to reside in Restalrig : That Sir Archibald Kinloch was subject to occasional fits of derangement, but he had no attack while he resided in Restalrig. Depones, That he is not positive ; but he rather thinks, that the ponds now are more numerous or larger than they were while he resided at Restalrig. Depones, That he does not remember the nature of the diseases of the people whom he visited at Restalrig ; but they must have been but trifling, or he would have marked them down. And all this is truth,’ &c.

‘ Daniel Rutherford, physician in Edinburgh, aged fifty years and upwards, being solemnly sworn, &c., depones, That, about twenty years ago, he had occasion to visit patients in the village of Restalrig : That there were then ponds or pits for collecting manure to the west of the village : That the patients whom he attended were ill of *slight coughs or slight feverish complaints*, which did not appear to the deponent to have any connection with their residence in the neighbourhood of the ponds : That he visited frequently patients in the village, and during several different years : *That the deponent did not consider the inhabitants of the village liable to any particular complaint from their residing in the neighbourhood of the ponds.* Depones, That, as a medical man, he is rather of opinion, that the effluvia from the ponds *are not noxious to health*, on account of the current of air which passes down the valley ; but that, if there was no air to carry off the vapour, in that case, the vapour from the ponds might be noxious to health. Interrogated, Whether, if the water from the foul burn, instead of being collected in pits or ponds, were spread over the whole surface of the meadow, would the same effects be apprehend-

' ed from the effluvia, or whether these effects would be
 ' greater or less? Depones, That he thinks the effects
 ' would be greater, from the meadow being alternately wet
 ' and dry, and from there being a greater surface for the
 ' exhalation of vapour; That the injurious effects proceed
 ' from the matter when in a drying state, and particularly
 ' in warm stagnant weather: That a greater number of
 ' insects would be generated if the water was allowed oc-
 ' casionally to run over the whole meadow and allowed to
 ' dry up, than if collected only in ponds. Depones, That
 ' he is not positive if there are any insects generated in the
 ' ponds below the surface of the water: but on the suppo-
 ' sition, and if the meadow was allowed to overflow at the
 ' time that such insects are generated, the number would
 ' increase in proportion to the extent of the ground cover-
 ' ed with water: That insects generated in such water af-
 ' terwards assume the shape of flies: That, *if the meadow*
 ' *was overflowed with pure water, many more insects would*
 ' *be generated than if the water was so impure as it is at*
 ' *present*; but there would not be such a smell from it
 ' even in the drying state: That the unwholesomeness
 ' of the vapour, whether from pure or impure water,
 ' would principally depend upon the length of time it
 ' had *stagnated*, and the warm weather; and more would
 ' depend upon the length of time it had *stagnated*, than
 ' whether it had originated from pure or impure wa-
 ' ter. Interrogated for the pursuers, depones, That there
 ' are ponds near the village, and on the west side of the
 ' road leading from the village to Jock's Lodge, and in
 ' passing these ponds the deponent has been sensible of
 ' an offensive smell proceeding from them, and to the
 ' deponent the smell was very offensive; but the de-
 ' gree in which it is offensive, must depend upon the
 ' state in which the person is at the time: That if the
 ' foul burn were allowed to run in its natural course, in
 ' place of being carried through ponds, the smell would be,
 ' equally offensive, but not so much diffused. Re-interro-
 ' gated for the defenders, depones, That *a bad smell is not*
 ' *necessarily injurious to health*. Interrogated for the pur-
 ' suers. Whether in no case, a bad smell may be injurious

‘to health, from whatever cause such smell may proceed ?
 ‘Depones, That a bad smell may have an effect upon one
 ‘person, and none at all upon many others : that, for ex-
 ‘ample, it might throw a woman into an hysteric fit, while
 ‘it would have no degree of effect whatever, perhaps, on
 ‘any one of the present company. Depones, That he has
 ‘no doubt that the smell from the ponds might produce
 ‘squeamishness upon delicate people, who have an anti-
 ‘pathy to bad smells ; that the deponent would not re-
 ‘commend the village of Restalrig as a proper residence
 ‘for delicate people, on account of the lowness of the situa-
 ‘tion, and likewise on account of the disagreeable effluvia
 ‘which proceed from the ponds. And all this is truth,’
 &c.

This testimony of Dr Rutherford is much founded on by the Police Committee (p. 51) ; but it is evident, that whatever effect it might have had in the action in which it was taken, it affords no support to the clamour of the present agitators. *1st*, It refers to numerous ponds, having a bad smell, near Restalrig. But these ponds have, several years ago, been filled up. *2dly*, It bears, that, if the water were spread out, it might be more injurious than if confined, but ‘more would depend on the *length of time it had stagnated*,’ than whether ‘it originated from pure or impure water.’ In point of fact, however, there is no stagnation of water on the meadows in question. There is only irrigation, which is utterly inconsistent with the stagnation of water. *3dly*, The Doctor says, that the injurious effects proceed ‘from the matter in a drying state.’ But there is no matter spread out to dry on the irrigated meadows. The grass under irrigation is never left in a drying state to be used as hay. The water flows in a continued stream, which is occasionally turned off, but only to allow the verdure or growth to proceed, which implies that the grass is in a succulent state. *Lastly*, The Doctor would not send his patients to Restalrig on account of the ponds, and the low situation of the village. But the ponds are gone ; and the question here is, not whether the site of Restalrig, in the dulness of low ground, is the best for the recovery of the sick, but whether it is ren-

dered unhealthy by the adjacent irrigation. Assuredly, that question is not decided in favour of the Police Committee by Dr Rutherford. His testimony refers to the ponds exclusively. He was not interrogated about the effect of irrigation by water never stagnant; and, as to smell from the ponds, he held it to be not productive of disease. Let it not be forgotten, that, in 1834, the Police Board relied on that opinion as correct, when they brought forward their project to make tanks or ponds within the bounds of the Police to collect dung in them for sale.

‘ John Mason, clerk-assistant in the Canongate, aged
 ‘ forty and upwards, who being solemnly sworn, *ut supra*,
 ‘ depones, That he is factor for Mr Richard Cooper of Lon-
 ‘ don, over one house and a yard in the village of Restal-
 ‘ rig: That he is also factor over some houses in the Can-
 ‘ nongate, belonging to the said Richard Cooper and his
 ‘ sister, Mrs Lind, spouse of Francis Lind of London:
 ‘ That, by instructions from Mrs Lind, he has been in the
 ‘ use of paying certain small annuities to several persons
 ‘ residing in the village of Restalrig, viz. Marion Toward,
 ‘ Helen Douglas, Barbara Blackie, and Ann Hird: That
 ‘ he has paid these annuities since 1801: That the two
 ‘ first of these persons died prior to Lammas last, and the
 ‘ deponent understands that Barbara Blackie has died since
 ‘ that time, but he understands Ann Hird to be still alive:
 ‘ That Marion Toward and Helen Douglas appeared to
 ‘ be very old people indeed, and a year or two before their
 ‘ death, were unable to walk from age: That Barbara
 ‘ Blackie appeared also to be an old woman, but seemingly
 ‘ not so old as the others; but Ann Hird does not appear
 ‘ to be so old as the others: That he does not know the
 ‘ age of any of those persons, but from appearance, he would
 ‘ judge the three first to be from seventy to a hundred,
 ‘ and he would suppose Ann Hird to be above sixty years
 ‘ of age: That the deponent understands that the above
 ‘ persons were servants or domestics in the family of Mr
 ‘ Cooper’s and Mrs Lind’s father, who resided at Restal-
 ‘ rig, as the deponent has heard. And all this is truth,’ &c.

‘ Andrew Sim, engraver to the Bank of Scotland, a wit-

‘ness formerly examined for the pursuers, who, being solemnly sworn, &c. depones, That he has sworn in his former deposition, that he resided in the village of Restalrig from the year 1758 to the year 1787: That *the village was considered as a healthy place of residence: That he never knew of any person having been in bad health from the smell arising from the ponds.* Depones, That the houses to the north of Mr Fletcher’s house were built partly by Mr Fletcher and partly by Mr Telford; but he cannot say whether they were built prior to the year 1780 or not: That he thinks, but cannot be certain, that at the time they were built there were ponds in the meadow of Restalrig. Depones, That Mr Scott’s house has been built since the deponent resided in the village; but he cannot say in what year it was built. Depones, That William Begbie resided in the village of Restalrig, and died at an advanced period of life.’

Some farther testimony was adduced to the same effect, which it seems unnecessary to quote. The opposite party, pursuers, examined various witnesses to prove that the ponds (which no longer exist) produce a disagreeable smell. They did not venture, however, to put to their witnesses a single question tending to shew that the health of the witness and his family had been injured by the ponds, or the burn and the meadows. To this rule, however, they made two exceptions,—1st, William Wishart, schoolmaster, who totally broke down, as a witness in their favour; he made oath that ‘he never kept his health better in his life than when at Restalrig.’ 2dly, They put questions on the same point to David Reid, a tenant of the pursuer Mr Duncan. He explains that he was habitually liable to illness, but adds, ‘that he came to the village in a state of bad health from Russia: That he lived in Leith from the month of November to the month of February, in which month he came to the village, and, during that winter, he was afflicted with the same complaints, and was labouring under them when he came to Restalrig. Depones, That he

‘ has a wife and five children who are all alive, and the
 ‘ eldest child is from seven to eight years old : That *none*
 ‘ of his family are affected with the complaints he has for-
 ‘ merly mentioned, but are all of them particularly healthy.’

Thus, on the subject of injury to health as a question of fact, the pursuers in Mr Duncan’s case were completely unsuccessful. They attempted, no doubt, to rely on some speculative opinions of doctors, from which quotations are given in the present Police Pamphlet. These speculations being supported by no facts, were necessarily disregarded by the Court that decided the cause. The sum-total of them appears to be this : that marshy grounds, and stagnant marshes, and putrescent animal and vegetable matter, produce remittent fever, especially in warm climates, and the ponds are said by one doctor to be a preparation of marsh. As already remarked, however, only one remains of the nineteen ponds that existed in the valley of Restalrig at the date of the action, and agricultural irrigation is absolutely inconsistent with the existence of marsh.

The evidence in Mr Duncan’s action did not rest exclusively on the testimonies of the witnesses, whether doctors or others. There was farther exhibited the Record of the old Churchyard or Burial-ground of Restalrig. It is authenticated on oath by Mr Wishart the schoolmaster, and official keeper of it. From that record, it appeared, that, among the witnesses examined on both sides, there were persons of very mature age, who had long resided in Restalrig, and been exposed to all the evils—if evils they were—that attended that locality. Of the pursuers’ witnesses, the following may be noticed :—

	Resident in Restalrig,	Aged
Andrew Syme,	29 years	63 years.
James Muckle,	40	78
Peter Johnston,	all his life	74
James Stewart,	34 years	68
John Scott,	50	88
James Lawson’s father } and mother,	51 or 52 years	{ 76 72

Several of the defenders' witnesses were still older, viz.

	Resident in Restalrig,	Aged
Thomas Nicolson,	20 years.	75 years.
George Crabb or Craib,	27	73
Henry Baird,	12	70
His grandfather,	19	81
Barbara Isleman,	30	80

The village of Jock's Lodge, in contact with the military barracks, is on the declivity immediately above Restalrig. With a view to the question of safety to human life, there was obtained from the same record, and authenticated by Mr Wishart, a list of deaths for forty years prior to 1809, of inhabitants of Restalrig and Jock's Lodge.

	Restalrig. Aged.	Jock's Lodge Aged.
1764, Mar. 23. James Telfer,	...	93
Apr. 11. Widow Johnstone,	...	72
1765, Mar. 14. David Buchanan,	92	...
1765, Nov. 9. Mrs Butler,	80	...
1766, Jan. 19. Arthur Bishop,	76	...
Feb. 23. D. Buchanan's wife,	88	...
1774, Jan. 17. David Gilchrist,	76	...
Feb. 5. William Buchanan,	66	...
1775, June 12. George Muckle,	87	...
May 21. James Robertson,	99	...
1778, Jan. 19. Mrs Cowie,	73	...
Aug. 19. W. Grieve's mother, Mrs Thomson,	75	...
1784, Mar. 8. James Brown,	84	...
Oct. 17. James Johnstone,	86	...
1788, Nov. 21. John Johnston,	78	...
1790, Oct. 11. Andrew Aitken senior,	68	...
1793, Mar. 5. George Simpson,	...	85
22. William Fletcher's wife,	78	...
Apr. 24. Margaret Aitken, Peter Erskine's widow,	85	...
Dec. 20. James Robertson's wife,	85	...
1795, Feb. 4. David Lawson,	79	...
Apr. 28. John Weatherston,	...	78
1796, May 8. William Fletcher,	84	...
July 1. John Weatherston's widow,	...	77
1797, Apr. 21. Thomas Wood,	...	95
Nov. James Windroom,	90	...
1799, Feb. 14. Widow Cruickshank,	81	...

	Restalrig. Aged.	Jock's Lodge. Aged.
1800, Jan. 30. Mrs Mary Veitch, . . .	...	89
1803, Oct. 21. Duncan Forbes's wife, . . .	75	...
1804, May 31. Edward Coustin, . . .	75	...
July 16. Duncan Forbes, . . .	80	...
Dec. 15. Widow Douglas, . . .	81	...
1805, Feb. 24. Marion Toward, . . .	86	...
1806, Mar. 14. John Boggy, . . .	81	...
June 23. James Ronaldson, . . .	73	...

There has also been procured, from the same record, a continuation of this list, both as to Restalrig and Jock's Lodge, from 1809 to the present time. It includes such of the persons who had been examined as witnesses in Mr Duncan's case, and had not removed elsewhere. These witnesses (which are marked thus *) lived years afterwards.

This list is as follows :—

	Restalrig. Aged.	Jock's Lodge Aged.
1806, Aug. 6. Margaret Blackie—an old woman.		
1808, May 31. David Gilchrist,* . . .	79	...
1810, May 9. Ann Geddes Petrie, . . .	76	...
Nov. 25. Ann Herd, . . .	75	...
1812, Jan. 12. Robert Rae, . . .	...	73
28. May Muckle, . . .	84	...
Sept. 23. Mrs Wylie, . . .	...	74
Dec. 20. Thomas Nicolson,* . . .	...	84
1814, Jan. 25. Peter Johnston,* . . .	81	...
June 30. Barbara Isleman,* . . .	86	...
July 17. John Milne, . . .	...	78
Mar. 13. James Muckle,* . . .	87	...
1816, Jan. 5. David Barbour, labourer, . . .	71	...
Mar. 1. Hugh Fraser, . . .	84	...
1817, Feb. 23. Daniel Sutherland, . . .	...	75
Mar. 30. Margaret Dickson, . . .	...	72
Apr. 15. Thomas Easton, . . .	...	74
Sept. 26. Margaret Paterson, . . .	...	90
Oct. 5. Helen Ranken, . . .	...	68
1818, Mar. 1. Margaret Williamson, . . .	...	76
1819, Dec. 15. James Bell, . . .	84	...
1820, May 18. John Fletcher, . . .	...	70
Aug. 30. Daniel Oliphant, . . .	...	75
31. John Mackie's widow, . . .	...	81
1821, Jan. 4. John Carstairs senior, . . .	...	80
Apr. 6. Robert Toft senior's wife, . . .	...	73
1822, Sept. 7. James Begbie, . . .	...	72

	Restalrig.	Jock's Lodge.
	Aged.	Aged.
1822, Dec. 8. John Carstairs's wife, . . .	68	...
1823, June 16. David Rait's wife, . . .	65	...
25. Andrew Aitken's wife, . . .	72	...
Nov. 27. James Stewart's wife, . . .	91	...
1824, Apr. 21. Ann Walker, . . .	...	68
Oct. 6. Andrew Gilchrist's wife, . . .	...	74
1825, May 13. Robert Tofts, . . .	...	76
1826, Dec. 10. John Carstairs's widow, . . .	...	84
1830, Feb. 19. Alexander Gow, . . .	...	83
1831, Jan. 30. Marcus Calder,* . . .	86	...
1832, July 12. Helen Aitken, . . .	...	68
Oct. 9. Harper Crow, . . .	83	...
30. Janet Mathison, . . .	75	...
1833, Feb. 8. Robert Barclay, . . .	83	...
Dec. 5. Helen Watson, wife of Wm. Petrie, . . .	76	...
1834, Jan. 11. Andrew Simpson,* . . .	...	84
Feb. 5. Scott, . . .	74	...
1835, Mar. 18. Mrs Wright, widow of Jas. Wright, . . .	75	...
1836, Jan. 27. Andrew Aitken, . . .	73	...
1837, Apr. 30. Mrs Mary Stewart or Johnston, . . .	...	77
widow of the late John Johnston, . . .	...	77
Dec. 6. Robert Anderson, . . .	...	75
July 11. Mary Anderson, . . .	...	87
Oct. 27. Isaac Smart, . . .	...	86
1839, Jan. 25. Andrew Ford, . . .	77	...

If longevity be a proof of health, as undoubtedly it is of safety to human life, it is rather thought that Restalrig and its neighbour Jock's Lodge, may stand a competition in point of salubrity with any village in the British Islands. Robertson and his wife, who lived on the irrigated grounds, reached the ages of 99 and 85 years; and one of the pursuers, in Mr Duncan's action, Fletcher and his wife, lived, the one to 78, and the other to 84 years.

The witnesses examined in Mr Duncan's action, were chiefly persons in humble station; but it has already been explained that, antecedent to that period, persons in a different condition were accustomed to resort to Restalrig, and although the improvement by finer roads, steam-boats, &c., has scattered more widely the upper classes of Society, the neighbourhood of the irrigated meadows is still respectably inhabited. Thus, Mr Duncan's house now belongs to Mr Richardson, W. S. He, with his numerous family,

(twelve children), reside there during all the summer season, and in winter in Edinburgh. Mr Glas occupies Marionville, having agreed to pay for it the highest price it had ever cost. The house of Mr Mitchell, one of the wealthiest commoners in Scotland, is at Parson's Green, overlooking the meadows. Bailie Nicolson of the Canon-gate, first resided four years in a house next to Clockmill Bridge, and having proved the healthiness of the district for a rural residence, he erected a costly and very handsome villa, in which he resides, situated to the west, and close to the house he had occupied as tenant. Mr Miller of Craigentenny also resides in Craigentenny House (which is nearer to the foulburn and the meadows than any of these), when his Parliamentary or other avocations permit his absence from London, and his seat in Buckinghamshire.

The matter does not rest here or on presumptions. The question of health has already been decided in a Court of Law; but in any other shape in which the point could be brought forward, it would be demonstrated by overwhelming testimony, that the pretext is utterly groundless that the irrigated meadows produce detriment to human health or the safety of life. And that, too, even under the disadvantage resulting from the Gas-works. As already remarked, above 400 persons, consisting of the cowfeeders and their servants and families, are daily occupied on the meadows during the season of summer and autumn, so that, were these meadows a source of what is called malaria, and consequent ague and intermittent fever, there are abundance of persons on whom the pretended *malaria* might operate, and to whom, if acting with any degree of fairness, the Committee of Police ought to have resorted, if the investigation of truth was their sole object. These cowfeeders also have kindred and neighbours who are acquainted with the state of their families. But the Police Committee have, in their zeal, gone beyond the question of human safety, and allege that the meadow grass is poisonous to animals, that cattle and horses refuse to eat it: That if they do eat it, they cease to thrive and speedily die: That, in the mean while, they give forth bad

milk and bad butter. These averments are so palpably false, because inconsistent with the possibility of profit being for years derived from these meadows by their owners, that perhaps they might be left for refutation to their own absurdity. But, in justice, the proprietors are bound to defend the reputation of their tenants, and of the property let to these tenants.

One fact of extreme notoriety might of itself supersede farther statement. It is known that, from the joint-stock frenzy of 1826, the project emanated, that a number of gentlemen of Edinburgh subscribed a large capital towards setting on foot a dairy company. They bought lands, and erected a sumptuous palace to contain their stock of milch cows. These they purchased of the true Ayrshire and other choice breeds. The buildings remain overlooking the meadows; And to what quarter did this company of gentlemen look for food to their stock of cows? The position of the dairy-buildings had been selected from its vicinity to the irrigated lands, and to the irrigated meadows, and to the produce of these meadows, the company looked for subsistence to their cows. These cows were supported accordingly during every summer and autumn on the meadow grass. It is true, this mighty company found the project in which they had engaged unprofitable. They could not compete in the market with the thrift, and industry, and humble prudence of the ordinary cowfeeders and their families; but this is notorious, that the cows of the dairy company enjoyed good health,—that the company sold to the first families in Edinburgh, large quantities of milk, butter, and cream of the best quality,—that, during the strawberry season, large parties of ladies and gentlemen frequented their establishment, to enjoy the luxury of feasting on that fine fruit presented along with the richest cream. The fictions of the correspondents of Mr Drysdale had not then been invented. That gentleman being himself a regularly bred writer to the Signet, and practitioner of the Law, let him try his case by the test of what is called a precognition, or inquiry at competent witnesses, and he will find its utter futility. Knowing how the facts stand, and by whom the meadows are daily

frequented, no such investigation is necessary to prepare the proprietors for a refutation of the fictions and absurdities of the Police pamphlet.

Were the case, after the final judgment in Duncan's action capable of being brought to the legal test of proof by testimony it would be proved, 1st, By William Storrar, that he has been engaged in cutting the meadow grass every season during thirty years,—that the whole statements relative to it, published by the Police Committee, are utterly unfounded,—that horses and cows eat the meadow grass with avidity,—that he has a horse which, during the cutting season, is fed with almost no other food, and thrives well. He keeps about forty cows,—that, from about the middle or end of March to May, the cows are in a delicate state as to health, because turnips and other green food are then exhausted or yield little nourishment, but as soon as the cows obtain the meadow grass, they become perfectly healthy, and are always most healthy while it lasts. Even a handful of grass, given to them per day, in a late spring, is valuable to them. He supplies a part of the most respectable inhabitants of Leith, medical men, and others, with milk, butter, and cream, which they pronounce to be excellent. He supplies also many families in Edinburgh with butter,—that article, supplied by him for a late public breakfast at the Exchange Buildings in Leith, was highly applauded as singularly excellent. The milk from meadow grass, in ordinary weather, may be kept forty eight hours, and always as long as any other milk with clean vessels. That milk is most wholesome as an article of food. His servants use it constantly, and none are more healthy. He never was more healthy than when cutting the meadow grass for his cattle during the last thirty years. The statement ascribed to Archibald Waddel about cows being hurt by eating meadow grass, is totally untrue. Waddel was a cowfeeder at Hawkhill, and had a small dairy of five or six cows, but has given up the business in consequence of the death of his wife. A similar averment ascribed to Johnstone of Leith Walk, is equally untrue. He was very unfortunate in his business as a dairyman, but from causes

very different indeed from the quality of the meadow grass, which never hurt his cows. They generally died, but not at the time of the year when meadow grass is furnished, and not from any connection with that sort of food. The foolish story ascribed to Mr Rankin about a child vomiting its milk, Mr Storrar believes to be either groundless or to have proceeded from some other cause than that the milk was obtained from cows fed on meadow grass. In short, cows and horses greedily eat meadow grass and thrive on it, and men are not injured by labour upon the meadows.

Nay, 2*d*, it can even be proved by James Johnstone and his wife, that the statement ascribed by the Police Committee to Mr Johnstone, is untrue, and was never uttered by them. No doubt, seventeen or eighteen of their cows died, but it was in winter, when meadow grass is not used, and they were never hurt by the grass. 3*d*, The pursuers will prove by Peter Macgregor, Hope Terrace, Leith, who, for twenty-two years, has been a cowfeeder with a stock of fifteen cows at an average, that, during summer, his cows and horses use the meadow grass, and are most healthy,—that the use of that grass recovers sickly cows,—that, during twenty-two years, he has cut the meadow grass for his cattle, and found his health rather improved, and never injured by the exercise. In other respects, he supports all the statements of Mr Storrar.

4*th*. John Paterson, who, for seventeen years, has kept a stock of thirteen cows, and fed them and his horses on meadow grass, will support the same statements. He had a horse that, for nine years, used the meadow grass and never had an illness. His milk gives great satisfaction to his customers, who declare that they do not find it equalled, when occasionally they reside in the country at a distance from town. He will support all the statements of Mr Storrar.

5*th*. Charles Whigham, who keeps a score of cows, and during twenty-seven years has fed his cattle and horses with perfect success on meadow grass, and employed himself in cutting the same grass, will make similar statements. 6*th*. Also Francis Bryce, who feeds eighteen cows and a horse on meadow grass, and has used it and employed himself in

cutting it, will support the same statements. His family have been most healthy.

7th. John Hume used meadow grass during sixteen or seventeen years. The milk and butter produced were of excellent quality. About four years ago, he became tenant of a small farm, on the produce of which he now supports his cows, but they do not thrive better, nor produce better milk and butter, than when fed on meadow grass. He does not believe Mr Rankin's story about a child vomiting milk on some occasion from the use of meadow grass. He has a son fifteen years old, who, from the age of ten months, obtained no other food than meadow grass milk, with the usual accompaniments, and there never was a healthier child. The infant children of Mr Hume's most respectable customers (being persons of eminence) were fed, and enjoyed perfect health while fed, with that milk. His cows and horses were perfectly prosperous when fed on meadow grass.

8th, George Gunn, Stockbridge, who keeps thirty-two cows, and has used meadow grass about nine years; has a small farm, the produce of which partly supplies his cattle. They thrive rather better on the meadow grass than upon clover. The milk and butter produced by that grass are excellent, and are used by his own family. If the story were true that meadow grass injured cattle, many thousands would annually be lost, whereas they thrive, and are fond of it. They are generally changed annually, because, not being put in calf, they fatten rapidly on the meadow grass, whereby the produce of milk declines, and they become fit for the butcher. By means of that grass the cows are kept in a most healthy state, and if sickly, they recover.

9th, It can be proved by Mr Wilson, who for seventeen years has had a stock of twenty-six cows or more fed on meadow grass, along with his horses, that they all thrive on it, and the produce, especially of butter, of which he makes a great quantity, is considered excellent. The butter-milk will compete with any that comes from the country, and no sweet milk keeps longer. All his servants,

especially those employed in cutting the meadow grass, enjoy excellent health. His cows and horses get no other food than the meadow grass during the season, and are perfectly healthy. The same statements will be proved by Mr Ramage, James Laidlaw, Bentley Douglas, and a multitude of others, cowfeeders.

CAVALRY BARRACKS AT PIERSHILL.

The Police Committee have made (p. 40, 45) a special and very formidable article of the Piershill Barracks, which, by dint of arithmetic, they represent as being, to the amount of a fraction, more unhealthy than the other barracks in the British islands. They rely upon certain documents in the form of reports and on letters, and, finally, they furnish a formal essay or statement, dated 21st October 1839, having the signature "James Y. Simpson, M.D." The object of this last document, as explained by its author, is, "to endeavour to ascertain, by existing statistical data and numerical facts, the actual existence and comparative extent of the insalubrity of Piershill as a military station." (P. 42.) He adds, that "the troops at Piershill are so freely exposed to the effluvia from the irrigated lands, and the official military returns of their force, and of the proportion of their sick, are kept with such comparative precision, that we have turned to them as affording by far the most accurate series of facts which it seems possible to obtain, for the purpose of testing the salubrity or insalubrity of the irrigated lands, by direct arithmetical data. After considerable labour and research among the Piershill returns, we have arrived at some results which may, as we believe, assist much in giving greater precision to the question of the insalubrity of these lands." (P. 43.)

Dr Simpson then refers to "Statistical Reports on the sickness, mortality, and invaliding among the troops in the United Kingdom," just laid before Parliament, and takes certain averages in these reports, as standards by which he compares the health of the troops stationed at Piershill during the years from 1832 to 1838 inclusive, with that of the whole troops generally.

The result of Dr Simpson's operation is represented as proving that the sickness and mortality of the troops at Piershill are greater than in the collective cavalry stations in the United Kingdom, and even greater than the average sickness of Gibraltar, &c.

The test for determining the question of health, as afforded by the military returns of Piershill Barracks, is thus in effect represented by Dr Simpson as the best which it is possible to obtain. Having appealed to that test, he and his employers cannot dispute the conclusiveness of the evidence which it affords when correctly examined. But some preliminary remarks may be necessary.

1. The surgeon of every regiment prepares a weekly written report, in which he records, under the word "strength," the number of men. He states, by its technical name, the disease of every soldier admitted into hospital, together with the deaths that occur, and details the progress of the fatal disease, the cause of death, and the appearances upon a *post mortem* examination. Each surgeon also prepares a monthly report, containing all the particulars now mentioned, to which remarks are added, if any occur, on the prevalence and cause of particular diseases. The monthly reports are transmitted to the Staff-surgeon in Edinburgh, who, from the collected reports of the surgeons of each regiment, frames a monthly report of the sickness and mortality of the whole forces in Scotland. This last report is transmitted to head-quarters at London. It contains every case of sickness and mortality, and the species of disease by name. It closes with "Observations" on the general state of health of the troops, contrasted with the health of the civil population.

Thus, there is no want of materials to fix the question of health in relation to Piershill Barracks. Two cavalry regiments are stationed in Scotland, the one at Piershill, and the other at Glasgow and Hamilton. The other troops are infantry, stationed at Edinburgh, Glasgow, Stirling, Perth, &c. The monthly reports of each of these regiments, contain, on the face of a single sheet, the name of each regiment, with all the particulars already mentioned, so that any person, on inspection, may at once compare the

relative proportions of sickness, death, admissions into hospitals, and specific diseases, at any one station, as contrasted with any other station. The whole particulars are stated in figures with the requisite titles.

2. The point attempted to be established by medical opinions in the Police Report, is this, That the irrigated meadows being marshes, and marshes being always productive of intermittent fevers, the meadows in question must necessarily produce such fevers, agues, &c., and all the other effects ascribed to malaria arising from marshes. Now, the Piershill Barracks are confessedly almost, if not absolutely, in contact with the irrigated meadows in question which bound them on the north. They were erected in 1794, nearly fifty years ago. On the other hand, there are no irrigated meadows near Glasgow or Hamilton. Thus, Dr Simpson, a medical man, and since elected by the Town-Council Professor of Midwifery, having before him the regimental reports, and himself framing a report founded on these, had a complete opportunity of supporting, if they could be supported, the medical opinions relied on by the Police Committee. In justice to these brethren of the faculty, it was manifestly incumbent on him to examine minutely the reports, in order to ascertain whether they do or do not support these medical opinions, which represent the irrigated meadows as producing a particular class of diseases. The fact, however, is broadly avowed by Dr Simpson, not only that he had not made any examination of this essential fact, but he appears to have positively and intentionally avoided making the comparison. After mentioning the sickness at Piershill, he is pleased to say, "This sickness, it may be farther observed, must be of such a degree of severity as to render it necessary for those affected to go into hospital. We cannot state if the sickness itself is liable to assume any particular form or type in those affected, as this is a point to which we have not directed our inquiries. The question of the comparative salubrity or insalubrity of the station, has hitherto alone engaged us." The question, how far the disease must be severe, that puts a soldier into the hospital, will be presently considered. In the mean time, it will presently be shewn.

that the import of the Government Reports is precisely the reverse of the general statement made by Dr Simpson. He says that he "*did not*, in examining the returns, *look at the lists of diseases*, to ascertain whether the sickness at Piers-hill assumed a particular form or type in those affected." This really is too much to be taken off the Professor's hands. The truth is, he cannot state this point as to the kind of sickness, because he is unwilling to do so. The general outcry of his friends is, that fevers, remittent, intermittent, &c., proceed from the meadows, and every monthly return has, on its face, the fevers inserted when fevers exist. The precise and conclusive question of fact is, Whether the opinions are proved or disproved by the lists? This will not be left where Dr Simpson has been pleased to leave it, whether honestly or not, it is for him to explain. A list of the fevers, &c. will be given.

3. Dr Simpson mentions that, from the reports, it appears that soldiers are "admitted into hospital in the ratio of 929 per thousand of force," while, at the same time, he pretends, as already noticed, that the sickness must be *severe* that sends a man to the hospital. This last statement is in reality an untrue averment, and Dr Simpson knows it to be so. If it were true, the whole army would be a mere body of invalids or patients under
 Report, p. 6. severe sickness. The fact stands thus. Major Tulloch, after stating the average sickness to be 929 per thousand among the cavalry, contrasts this with the tables of sickness among the working classes, and then refers to a report of the factory Commissioners, shewing that the average sickness at the dock-yards was only 407 among every thousand men; and he then proceeds thus.

Report, p. 6. "It now becomes necessary we should explain why the number annually under medical treatment should be nearly twice as high among the dragoon guards and dragoons, as the general mass of the population from which they have been selected. This striking disproportion is more apparent than real, and arises principally from the circumstance that, among soldiers, every case of disease which comes under treatment, however slight, is entered on the hospital books as an admission; whereas, in the dock-yards, or

among the working classes generally, cases are only recorded when of so serious a nature as to create an absolute disability for labour: the loss of wages consequent on such an occurrence must have a powerful tendency to reduce the number absent from sickness, which is understood to have been the principal criterion by which the existence of disease among the dock-yard labourers has been ascertained. This explanation is borne out by the fact, that, while the number of attacks of sickness in the dock-yards was 407, the deaths amounted to 15 per thousand of the strength. Hence 1 in 27 died of those attacked, whereas, among the Dragoon Guards and Dragoons, though there were 929 attacks out of every thousand present, the deaths from disease were but 14, or 1 in 66 of those attacked. Thus, though there are more than double the number of cases recorded, they must have been of a much slighter nature among the latter class than the former."

Major Tulloch then gives a table shewing the class of diseases affecting the military, after which he adds, that these "were of that class which seldom proves so serious as to incapacitate a person for the labours of civil life, and for which, were it optional on the part of the soldier, he would probably never have submitted to the confinement of the hospital. In order, however, to check every disease in its commencement, and prevent those serious inroads on the constitution which too frequently result from neglect, a medical inspection of the troops takes place every week, at which their ailments are detected and immediately brought under medical treatment. This important peculiarity must always be kept in view, in any comparison of the relative extent of sickness among the military and civil population."

Report, p. 7

4. Dr Simpson has utterly failed to disclose the evidence afforded by the regimental returns on the question of health. He has not ventured to disclose the comparative numerical facts of the Piershill returns with others in Scotland, though the returns for the other cavalry regiment at Glasgow and Hamilton were contained in the next columns to those of Piershill: so that he could not peruse the one

without having the other before his eyes. Yet the Professor has not ventured to compare the two. These two cavalry regiments are in all respects similar,—the same in “strength,” having the same duties, the same regimen or diet,* and the stations differing only in Piershill having in its vicinity the supposed unhealthy meadows, and the other entirely free from such. Yet no comparison is made, at least none is given; for such could not avoid being made. Next, there were the returns of the different infantry regiments, also placed on the same paper before Dr Simpson. Yet, the same studied avoidance of comparison with them takes place. Every death, too, at Piershill is specially reported on, detailing the immediate causes of death,—the nature of the disease,—how contracted,—its symptoms,—length of duration,—and, finally, the appearance upon *post mortem* examination. During the course of all the seven years embraced by Dr Simpson’s statements, these reports were open and patent. Yet, he has not found a single case which in any degree could be traced to the influence of the irrigated meadows.

5. No notice is taken by Dr Simpson of the health of the wives and children of the troops at Piershill. These wives and children are lodged either in the barracks or in the adjoining villages of Jock’s Lodge and Restalrig. In the monthly reports, the number is mentioned of the wives and children at the different stations. They are reported on to this extent, that where any generally prevalent disease or epidemic, or unusual mortality, prevails among them, the medical officer states its general nature, its symptoms, its effects—whether mild or severe,—and its supposed causes. Here, therefore, was a test to which Professor Simpson was bound to have adverted. Mr Henry Marshall, Deputy Inspector-General of Hospitals, “A gentleman,” (says Professor Simpson, and truly) “highly distinguished by his statistical works, and his Treatise on the Diseases of Ceylon,” considered the state of health of the wives and children at Piershill,—a material matter which deserved notice in this discussion. Hence, in his statement to the Police Committee, or their medical agents (which they have here only *partially* quoted as an authority under

this head of the pamphlet), Mr Marshall expressly mentioned the state of health of the wives and children. (P. 41.) But being such as proved Piershill not to be unhealthy but the reverse, Dr Simpson omits all notice of this part of Mr Marshall's statement, and also of the import of the monthly reports on this point.

6. Lastly, Dr Simpson has not found it convenient to give *tables* in figures, whereby to enable the community to judge of the numerical facts contained in the regimental reports. This defect shall now be supplied by taking the period fixed on by Dr Simpson, viz., from 1832 to 1838. But as the Cavalry Regiments change their stations generally in April or May in each year (remaining at a station twelve months), these seven years by the tables exclude the three first months of 1832, and include the three first months of 1839, so as to give the full stay of the regiments at the station in each of these two years. The whole tables begin and end each year with the arrival and departure of each regiment. There will be shewn the "strength" of each of the two cavalry regiments,—their number of sick, and of deaths; the number of fevers in each, and next the same particulars in the infantry regiments. There will next be quoted, wherever these are material, the "Observations" of the staff-surgeon subjoined to the reports, which contain in several different instances, valuable and important information on this very question of health. And, finally, a table will be given, shewing the total number of wives and children at Piershill, during this period.

The figures and quotations thus to be given, are correct copies, taken from the original documents, and are accurate under the usual limitation of unintentional mistakes expressed by the phrase, "errors excepted." They are the actual numerical statements, and not calculations of averages or general results. But it must be kept in view, that, in the Military Returns, the number of men in a station is stated every month, and a mistake might arise from confounding the yearly with the monthly numbers. Hence, in the "strengths" in the following tables, each monthly number is taken, and all are added yearly, and the total is divided by the number of months, whereby the number

of men is so far an average number. It must also be kept in view, that the total "admissions" into hospital, *i. e.* "sick," are stated in these tables, not the "remaining," *i. e.* the sick in hospital at the close of each month. The latter only are computed in the "Observations" of the staff-surgeon, in calculating the extent of sickness. This accounts for the small per-centage of sick stated in these "Observations," compared with that in the following tables.

TABLE I. Shewing the Sickness and Mortality, with the fever cases, first among the two Cavalry Regiments, and next among the Infantry Regiments, from 1st April 1832 to 31st March 1833.

2D DRAGOON GUARDS AT PIERSHILL NEAR EDINBURGH.							3D DRAGOONS AT GLASGOW AND HAMILTON.						
Strength.	Sick.	Dead	FEVERS.			Ratio of sick per 100.	Strength.	Sick.	Dead.	FEVERS.			Ratio of sick per 100.
			Com.	Int.	Typ.					Com.	Int.	Typ.	
321	226	5	13*	...	...	70	289	522	8	15	...	...	180

INFANTRY REGIMENTS.

STATIONS.	Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.
				Com.	Int.	Typ.	
Glasgow, .	745	896	13	10	2	...	120
Edin. Castle,	586	813	7	8	...	1	138
Paisley, .	253	192	4	...	3	...	75
Berwick, .	266	223	1	6	...	1	83
Dundee, .	202	258	1	21	...	...	127
Aberdeen, .	235	260	3	4	...	1	110
Stirling, .	280	262	5	7	...	...	93
Perth, .	246	379	2	11	...	...	154
Fort-George,	350	279	...	2	...	...	79

Here Piershill Station has *the minimum* proportion of sick in *the whole stations*, and what is singular, *Glasgow Cavalry* has the *maximum of the whole*, Piershill being 70 per cent. of sick, and Glasgow 180 per cent. The deaths at Piershill are 5, and at Glasgow, in the cavalry 8; fever cases at Piershill 13, in Glasgow cavalry 15. Other dispropo-

* The Returns to which access has been obtained, do not state the fever cases previous to 1st November 1832.

portions occur contrary to what might be expected, if *locality* were to be the rule. Thus, Paisley is only 75 per cent. in a dense manufacturing population, while Fort-George, a Highland district, is 79 per cent. ; Perth, amidst the finest rural district in Scotland, is 15-1 per cent. ; Stirling Castle 93 per cent. ; Aberdeen 110 per cent. No irrigation exists in these localities.

The "Observations" added to the monthly reports in the foresaid table, have not been obtained, with the exception of the three following :—

"Cholera morbus has disappeared almost from this City" (Edinburgh), "there having been no new case for three days, and, indeed, it has almost left every part of Scotland."

Report for
November
1832.

"Although the weather has of late been cold, boisterous, and wet, there has been no abatement of health amongst the troops in Scotland. The 82d Regiment stationed in the Castle, has a much larger proportion of sick than any other corps in this command. Their sick for months past have amounted to at least 10 per cent. upon their strength, which is nearly double the usual proportion. More than one-half of their sick, however, are in hospital with venereal in one shape or other."

"The 82d Regiment have become more healthy, but still has about $8\frac{1}{2}$ of its strength in Hospital."

Report for
December.

"Seven deaths occurred during the month, and of these seven, four deaths arose from pulmonary disease ; the remaining 3 from erysipelas of the head, fever, and paralysis."

Report for
February
1833.

N.B.—None of these in Edinburgh.

TABLE II. Shewing the State of Sickness, &c., of the Two Cavalry Regiments, and next among the Infantry Regiments, from 1st April 1833 to 31st March 1834.

6TH DRAGOONS AT PIERSHILL, NEAR EDINBURGH.							7TH HUSSARS AT GLASGOW AND HAMILTON.						
Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100	Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.
			Com.	Int.	Typ.					Com.	Int.	Typ.	
321	415	7	23	1	...	129	329	405	7	36	1	...	123

INFANTRY REGIMENTS.

STATIONS.	Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.
				Com.	Int.	Typ.	
Glasgow, .	696	873	10	34	4	...	125
Edin. Castle,	678	750	14	38	1	...	110
Perth, . .	250	269	3	20	2	3	107
Paisley, . .	260	282	3	40	...	...	108
Stirling, . .	238	380	5	49	...	5	159
Aberdeen, .	238	277	2	11	...	1	116
Dundee, . .	255	318	...	11	...	...	124
Fort George,	187	311	2	18	...	...	166
Greenlaw, .	220	305	1	15	...	...	138
Berwick, .	242	162	3	...	...	15	71

Here Piershill and Glasgow Cavalry stations are, this year, nearly equal, being 129 and 123 per cent. respectively, the fever cases at Glasgow are 13 *more* than at Piershill, and the deaths are precisely equal.

The *minimum* proportion per cent. of the whole is 71, and occurs at Berwick, while the maximum is 166 per cent., which (strange to say) is at Fort-George, and the next highest is 159 at Stirling. Thus affording other instances, how far localities are to be depended on, *during* the *same* period of time, as *criteria* for this question of health, Stirling, and Fort-George, exhibiting the highest proportions of sickness. The disparity in the number of fever cases is equally striking,—Stirling shewing 49 cases, and strength about equal to Piershill, which has only 24 fever cases; Perth 20 cases of common fever, 2 intermittent, and 1 of typhus; and Fort-George, with less strength than any of these, shewing 18 cases.

The "Observations" subjoined to the reports, for the period embraced by this Table, are in these terms:—

Report for
April 1833.

" This epidemic (catarrh) appeared in the Royal Regiment in Glasgow about a fortnight ago, and within the last week it has seized a great number of men of the 82d Regiment in this castle (Edinburgh.). To-day there are about

100 men in the Sick Report with this disease, and all descriptions of people are suffering from it to a great extent."

"There has been an unusual number of deaths, viz. 11, or about 3 and $\frac{2}{3}$ ths per cent. per annum on the whole strength,—of these 11 deaths, 8 arose from disease of the lungs, 2 from fever, and 1 from fracture of the leg. Report for
May 1833.

"The influenza, of which I gave some account in my observations in last month's report, has prevailed at all the military stations to a greater or less extent. The number of cases admitted during the month amount to nearly 500," &c. It is owing to this circumstance that there is this month so great an increase of fatal cases. The influenza has now almost disappeared."

"There have only been two deaths this month, which is Report for
June —
"an *unusually* small number," &c. "The deaths this month arose from delirium tremens and continued fever."

"The troops in this command are at present *unusually* Report for
July —
healthy. There has been only one death during July, a private of the 93d died of continued fever at Aberdeen on the 31st July. He had previously been suffering from cough.

"Sick about $4\frac{1}{4}$ per cent. upon an average strength of 4060."

"Sick about $4\frac{7}{8}$ per cent. during August 1833. There Report for
August —
have been five deaths during the month, and the cases are given in detail by the respective medical officers. The troops in the command are healthy."

"There are only three deaths this month, which, upon Report for
Oct. —
the strength, is at the rate of about one per cent. per annum. All these deaths are from pulmonary disease, and in the two cavalry regiments. The troops are in general very healthy; even the number of sick in the 82d Regiment in "this castle" (Edin.) "is lower than it has been since the arrival of the regiment eighteen months ago.

"Cholera has not appeared amongst the troops, but has carried off several of the inhabitants both here and at Dundee, particularly at the latter place."

"The number of deaths this month is high, being Report for
Nov. —
less than nine. Five of this number from pulmonary diseases," &c. The 82d Regiment, since its arrival at this station from the Mauritius, has had at all times a nume-

rous sick-list,—the sick generally amounting to ten per cent. on their strength, being about double the number of other corps in this command.

“It has been stated, but with what justice I am not able to determine, that pulmonary diseases are more common and more severe in the Castle of Edinburgh, than at any other station in Scotland. The Barracks, from their elevated and exposed situation, must, of necessity, during the winter months, be cold, and liable to have currents of cold air constantly passing through them.”

Report for
February
1834.

“There have been four deaths this month,” &c.—“three deaths are from thoracic disease, which, in one shape or another, is always the most fatal in this climate. Mr Kell, 82d Regiment, reports a case of cholera at Glasgow. It occurred in a soldier of the 68th Regiment who had been employed as an orderly during the previous day to the officer commanding the detachment of that regiment. The man recovered under the use of calomel and opium. I have heard of no cases of cholera in Edinburgh or its neighbourhood.”

Report for
March ———

“There are five deaths this month;—three of the fatal cases occurred in the 82d Regiment, which has always a heavy sick-list, and at present there are upwards of ten per cent. in hospital. The civil population of this city (Edin.) is at present healthy.

“There has been an epidemic catarrh prevailing, but it is disappearing.”

These observations take notice of the otherwise too well attested prevalence both of influenza and cholera in the year 1833. But Piershill station is not in the slightest alluded to more than other stations, which, had any thing special occurred, would have been the case; especially as two deaths there in October from pulmonary disease are noticed. It is expressly mentioned in the report for that month, that cholera had not appeared among the troops, though it carried off several of the population in Edinburgh and Dundee. The report for July states the troops as “*unusually healthy*.” In regard to the wives and children of the stations, Piershill included, no notice whatever is taken.

TABLE III. From 1st April 1834 to 30th April 1835.

2D DRAGOON GUARDS AT PIERSHILL.							GLASGOW AND HAMILTON.						
Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.	Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.
			Com.	Int.	Typ.					Com.	Int.	Typ.	
293	262	6	20	2	...	89	315	320	3	6	...	...	101

INFANTRY REGIMENTS.

STATIONS.	Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.
				Com.	Int.	Typ.	
Edin. Castle,	744	846	12	49	19	1	113
Glasgow,	699	854	12	47	...	...	122
Perth,	222	242	2	22	...	1	109
Aberdeen,	233	227	4	7	...	...	97
Paisley,	225	197	2	8	...	...	87
Stirling,	212	216	2	2	2	...	101
Fort-George,	176	158	1	1	...	...	89
Dundee,	230	175	1	11	...	...	76

Here Piershill cavalry has a *lower* proportion of sick than Glasgow and Hamilton cavalry, the former being 89 per cent., and the latter 101 per cent. Fever cases at Piershill 20 common, and 2 intermittent, while 6 at Glasgow. But this is accounted for by the fact, that in Edinburgh Castle the fever cases are 49 common, 19 intermittent, and 1 typhus, in all 69, which is more than one-third above Piershill in proportion to the strength.

Locality, as before noticed, is so far from affording a test of health in Scotland, that Dundee, a manufacturing and populous district, is the *minimum* of the whole, though in other years generally amongst the highest in point of proportion.

The "Observations" are in these terms:—

"There have been six deaths this month, which is considerably above the average proportion. Four of these were produced from thoracic disease, and in the fifth, viz.

Report for
April 1834.

in the case of Thomas Payne, 82d regiment, as detailed by Surgeon Kell, there was, along with the affection of the brain, extensive disease of the lungs.

“The sixth death was caused by apoplexy, as detailed in my Report of the Detachment-Hospital; and the morbid parts are in readiness for transmission to Chatham.

“Epidemic catarrh has been prevalent in Edinburgh for some weeks, but is neither so violent nor so general as at this time last season.

“The 82d regiment at Glasgow has still a very numerous sick-list. Number of men in hospital, 71; strength present, 725: thus giving nearly 10 per cent. on the strength.

Report for
May 1834.

“During this month, there have been three deaths, but one of them, produced by smallpox in the 2d Dragoons, occurred at Newcastle. There have been several cases of modified small-pox amongst the troops in this command, but they have generally been slight.”

Report for
June —

“In the 6th Dragoon Guards at Glasgow, private Thomas Fisher died of mania of eight days’ duration, and induced by drinking ardent spirits. The disease seems, from Dr Herrott’s account, to have been closely allied to delirium tremens. The other two deaths arose from that most untractable of diseases phthisis pulmonalis. One patient, John Fraser, belonged to the 78th depot, stationed at Dundee; the other, Thomas Ahearne, 82d regiment, stationed at Glasgow.

“Fraser, though in the last stage of disease, was, improperly in my opinion, allowed to go on sick furlough, and died at Aberdeen on his way to Inverness. It seldom happens, so far as my observation extends, that sick furloughs answer the humane intention of those who grant them. It but rarely occurs that the sick soldier can meet with so good or proper treatment anywhere as in his own regimental hospital. It is the duty of the medical officer, by every persuasion, by every kindness, to induce the unfortunate sick man to remain in his own hospital. The troops in this command are healthy. In some places,

hooping-cough and measles have been prevalent among the children, but the season has been favourable for both.

“There is no considerable degree of sickness amongst the population in this city, (Edin.) The weather has for some time been warm and dry, but very seasonable. Mercury has not risen in the shade higher than 74° .”

“Cavalry regiments have generally a smaller proportion of sick than infantry, but in this return it is otherwise:— Report for
July 1834.

“1. The 6th Dragoon Guards (Glasgow) have in hospital, .	22
“2. Dragoons (Piershill),	21
	<hr/>
Total,	43

“Strength of the above regiments 628, or about 7 per cent., which is about double the usual proportion. In the infantry, at present the proportion of sick is under $3\frac{3}{8}$ per cent.

“The troops throughout Scotland are very healthy, as, indeed, the civil population are also. There have been two deaths during the month of July, and both from consumption.

“Dr Shanks mentions in his Report, that a case of severe cholera had occurred in the 82d regiment at Glasgow, but that the symptoms yielded in a few hours.

“At Glasgow, both in the 6th Dragoon Guards and 82d regiment, there have been a good many cases of diarrhœa, probably the effects of eating raw vegetables and unripe fruit at this season of the year.

“I have heard of no cases of cholera in this city or neighbourhood.”

“There have been three deaths: two from thorax disease, one from delirium tremens, but terminating in disease of the lungs. In the 82d regiment at Glasgow, there have been a few cases of mild cholera. Some have also occurred at Edinburgh and Leith.” Report for
August —

“Though the strength of the troops in this command is less by nearly 300 than last month, yet there is an increase Report for
Oct. —

of sick, which may be attributed to the arrival of two regiments from a warm climate.

“ There have been four deaths, and all have occurred at this station ; three in the 71st regiment, and of men just landed in the last stage of disease ; two with chronic dysentery, and one death with pulmonary disease.

“ The other death occurred in the 2d Dragoons at Piershill, and was caused by pneumonia. The man was master of the band, and aged 56, and had been complaining for some time. In the two cases of chronic dysentery, great disease was found in the large intestines.

“ The troops, on the whole, are healthy throughout the command.

“ In the return of the 6th Dragoon Guards at Glasgow, one case of cholera spasmodica is inserted, but no observations regarding it. I hear of no cases of cholera in this city.”

Report for
Nov. 1834.

“ Since last return, the sick of the 71st and 77th regiments, lately arrived in this command from the West Indies, have undergone a very considerable decrease. The strength of these two regiments is 1353, and their sick given in this return amount to 57, or little more than 4 per cent., which is below the ordinary per-centage of troops serving in this climate. The troops in Scotland are healthy. There have been a considerable number of catarrhal complaints, but not severe. There have been some cases of smallpox, after vaccination, at Paisley.”

Report for
Dec. —

“ In my observations on last month's return, I adverted to the small proportion of sick in the 71st and 77th regiments just returned from the West Indies. At that time, the sick of these two regiments amounted to little more than 4 per cent. At present, their sick amount to rather more than 5 per cent. ; and in this return it will be observed, that the proportion of sick in the two cavalry regiments is considerably greater—being near 6 per cent.—than in the 71st and 77th regiments just returned from Bermuda and Jamaica.

“ The weather has been very variable, and, at present,

catarrhal complaints are very common amongst the civil inhabitants of Edinburgh. Measles have also been very common, but very mild."

"Although the greater part of the troops in this command have been on the move during the past month, when the weather was very cold, very little increase of sickness has resulted from this cause. The movements of the troops were owing to the elections then going on. Report for
Jan. 1835.

"There is no death this month, which is a very unusual occurrence. The 71st regiment remains healthy in this castle (Edin.) During the month, forty-two men have been treated for venereal, a considerable proportion of those with buboes, which, with every attention as to early and active treatment, have terminated in suppuration. It is much to be regretted, that so many men should suffer from this malady. I am happy to hear at length there is a prospect of a lock-hospital being established in this city," &c. Such an establishment has long been called for. Measles have been very prevalent during this month amongst children and young people; but very mild, modified smallpox, after vaccination, has also occurred to a considerable extent amongst the civil population. Catarrhal complaints have been very common."

"This month, there are no fewer than six deaths: last month, there was only one. Five of these deaths have occurred in the 71st regiment in this Castle, and the 77th regiment stationed at Glasgow, and the remaining one occurred at Dunse. Measles and whooping-cough have prevailed much during the month. Amongst the children in Edinburgh, the former disease has been mild; but the latter severe, and has in many instances been fatal." Report for
Feb. ———

"During the month of March, there were six deaths from thoracic disease, or from delirium tremens (James Clerehew, 79th Regiment), and one from acute hepatitis. Report for
March ———

"Catarrhal complaints have been very prevalent and very severe in this city (Edin.) for some weeks, during which easterly and north-westerly winds have been blowing.

“Hooping-cough and measles among children are disappearing.

“There have been a considerable number of cases of smallpox nearly all modified.

Report for
April 1835.

“During April there have been three deaths. Catarrhal and rheumatic complaints have been prevalent during April, probably owing to the cold harsh state of the weather. The wind has generally been from the north-east. There have been considerable falls of snow on the mornings of the 16th and 17th April; the ice on the pools in the streets of Edinburgh was of considerable thickness.”

TABLE IV. From 1st May 1835 to 30th April 1836.

5TH DRAGOONS, AT PIERSHILL, NEAR EDINBURGH.							10TH HUSSARS AT GLASGOW AND HAMILTON.						
Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.	Strength.	Sick.	Dead.	FEVERS.			Ratio of sick per 100.
			Com.	Int.	Typ.					Com.	Int.	Typ.	
298	213	4	4	...	...	71	296	349	3	34	...	...	118

INFANTRY REGIMENTS.

STATIONS.	Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.
				Com.	Int.	Typ.	
Edin. Castle,	326	445	11	16	1	...	53
Glasgow, .	684	647	13	42	3	...	94
Perth, . .	173	155	4	2	...	1	89
Paisley, .	176	265	6	9	...	...	150
Stirling, .	210	238	6	4	...	...	113
Aberdeen, .	197	213	2	2	...	...	108
Fort-George,	204	89	...	...	...	...	43

Here Piershill shews a proportion of sick of 71 among every 100 men, while Glasgow shews 118, with 4 deaths in the former and 3 in the latter. Fever cases: in Piershill 4 of common fever, and in Glasgow 34 of common fever; while the strength of both regiments is equal to within one man, Piershill having 298, and Glasgow and Hamilton 297.

The minimum proportion of sickness in all the infantry regiments is 43 per cent., which occurs at Fort-George, the maximum is 150 per cent., which occurs at Paisley.

The "Observations" are as follows:—

"During May there have been five deaths, including Serjeant-major Moorhead, 5th Dragoon Guards, who was shot in the back by private Bell of the same regiment, on the evening of the 17th of May, and died on the night of the 25th. On examination after death, it was found that the pistol ball had broken off the spines of the 8th and 9th dorsal vertebræ, and had cut across the spinal canal. The preparation of the morbid parts is in readiness to be forwarded to the museum at Chatham by the first opportunity. Report for
May 1835.

"5th Dragoon Guards at Piershill also lost another man by pneumonia, after an illness of six days. The appearances on dissection are detailed by Dr Logan in his report.

"During the month of May, the temperature was very low for the season. Winds generally from east and north-east.

"A mild ophthalmia was common amongst the civil inhabitants, and hooping-cough amongst the children."

"During the month of June there have been three deaths. Report for
June —

"Although the troops in this command have been moving a good deal during the month, yet the number of sick in consequence is very small, being only 3.3 per cent. on the strength. The 71st regiment in this Castle is particularly healthy, having at the present time only 2 per cent. in hospital."

"Deaths during the month three.

"It will be remarked upon inspecting the monthly return of the 77th regiment, that ocular disease is prevalent in that corps, and that the number affected had increased during last month. The 10th Hussars stationed in the same garrison with the 77th regiment, it will be observed, has not a single case of ophthalmia. Report for
July —

"The depots of the 72d and 78th regiments have left Scotland for Ireland during the month, and these depots have been replaced by the 64th and 76th regiments from Ireland."

Report for
Aug. 1835.

“ There have been four deaths during the month, and all of them in the 77th regiment but one.

“ The troops in Scotland are healthy.

“ The weather during the month has been for the most part dry. Prevalent wind east.

“ Some cases of common cholera have occurred.”

Report for
Sept. —

“ There has been during the month only one death, which occurred in the 64th regiment at Stirling.

“ The troops throughout the command are healthy.

“ In this city (*i. e.* Edinburgh) scarlatina is prevalent amongst the children, and catarrhal affections are common amongst all classes, owing probably to the diminished temperature and increased fall of rain during September, there having been only five dry days in the course of the month.”

Report for
Oct. —

“ There have been during the month two deaths.

“ In the 77th regiment at Glasgow, ocular disease has continued to prevail during the month. Surgeon Dealey reports that 26 cases have been treated during the month, and that 18 cases remain. In the 10th Hussars at Glasgow, there is no case, and there are only three other cases in the return, namely, two in the 64th depot at Stirling, and one in the 92d depot at Perth. Surgeon Dealey assigns no cause for the prevalence of ophthalmia in his regiment, but it is probable on this subject a special report has been made by Dr Williams, staff-surgeon.

“ The troops in this command are healthy, catarrhal complaints with sore throats have been common amongst the civil population.”

Report for
Nov. —

“ There have been six deaths this month, which is much above the average number, two of these men belonged to the 5th Dragoon Guards, and were absent on sick furlough, and appear to have died of consumption.

“ The troops are very healthy, &c. Among the civil inhabitants of this city (*i. e.* Edinburgh), catarrhal complaints accompanied with inflammatory sore throats have been common. Cynanche maligna, with or without redness of the skin, has also prevailed, particularly amongst the young, and in many instances has proved fatal.”

“Catarrhal complaints are common among the civil inhabitants here, and scarlatina also prevails, and in many instances has been fatal particularly to the young.” Report for
December
1835.

“The weather during the past month has been often boisterous, rainy, and cold, exceedingly changeable and very disagreeable to the feelings. There have been considerable falls of snow. The mercury has never sunk below the 25° of Fahr. The troops have remained healthy. Catarrhs have been very prevalent among the civil population. Scarlet fever has also been common and often fatal. Typhus has prevailed amongst the poorer classes in the old part of the city. A well marked case of cholera proved fatal at Leith in the end of January.” Report for
January
1836.

“The weather during February was for the most part boisterous, unsettled, with considerable falls of rain and snow. Cynanche maligna has been prevailing to a considerable extent among the civil population in this city, and in some families has been very fatal. *The troops have hitherto escaped.*” Report for
Feb. —

“Scarlet fever has continued to prevail amongst the civil population to a considerable extent during the month, but it has been more mild. It has run through the Barrackmaster’s family in this Castle, but as yet has not attacked either the soldiers or the families of the soldiers of the 71st Regiment. The weather of late has been cold, wet, and stormy.” Report for
March —

“In the 96th Regiment, Surgeon Shorland mentions the death of another man that took place on 23d April at Dumbarton, making (including Lieutenant Corporal Bell, 80th Regiment) no fewer than thirteen deaths during the month of April 1836. Of these deaths, nine have been produced from thoracic disease, which is a greater number than I recollect to have occurred in any one month. I believe the spring season is commonly severe upon invalids with affections of the lungs, but this season has been peculiarly harsh and intemperate, with a very low temperature for the season. In the month of May 1833, after the prevalence amongst the troops of influenza, there were eight deaths in Scotland from pulmonic disease. It ap- Report for
April —

pears by last annual report, that 42 per cent. of the whole deaths in Scotland arose from thoracic disease, &c. Catarrhal affections have been common amongst the civil population. * A change of quarters among the troops is in progress. Four troops of the 5th Dragoon Guards have marched from Leeds, and have sent six men to this hospital."

Here it is recorded, that though the troops in the month of June were moving, the sick were very few. In Edinburgh, scarlatina was prevalent in September among children, and in November and December catarrh and inflammatory sore throats, &c. were also prevalent, and these, with the addition of scarlet and typhus fevers, were so also in January 1836; but, it is added, the troops "*have hitherto escaped.*" The children of the regiment at Piershill are *not* reported to have been attacked.

TABLE V. From 1st May 1836 to 30th April 1837.

9TH LANCERS AT PIERSHILL, NEAR EDINBURGH.							14TH LIGHT DRAGOONS AT GLASGOW AND HAMILTON.						
Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.	Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.
			Com.	Int.	Typ.					Com.	Int.	Typ.	
290	351	6	41	...	2	121	299	359	14	47	...	1	120

INFANTRY REGIMENTS.

STATIONS.	Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.
				Com.	Int.	Typ.	
Glasgow,	673	835	26	79	...	...	124
Edin. Castle,	557	484	4	28	...	...	85
Stirling, .	183	273	6	...	...	...	149
Perth, .	171	195	2	...	...	...	114
Fort-George,	207	354	3	...	...	...	171

Here the proportion of sick at Piershill and at Glasgow is equal to within 1 per cent. Deaths at the former, 6; at Glasgow, 14. Fever cases at Piershill, 41 common, and 2 typhus; at Glasgow and Hamilton, 47 common, and 1 typhus. It is matter of notoriety, that fever was unusually prevalent in Edinburgh this year. Influenza also prevailed

over all Scotland. Notice of these accordingly occurs in the observations on the monthly reports, and, in particular, the months of May, June, December, January, and March, of this period.

The proportion among the infantry varies, but, as usual, is not according to what, from the locality, might be anticipated. For Fort-George, the proportion per cent. of sick, is 171, and for Stirling 149, being the highest, and both considerably above the city of Glasgow, with its dense manufacturing and destitute Irish population, the proportion of Glasgow being only 124 per cent.

“Observations” by the surgeon are as follows :—

“Scarlet fever continues to prevail to a considerable extent amongst the civil population in Edinburgh. Catarrhal complaints have also been common, and often tedious. Easterly winds have blown during the month. The nights have been cold, and the days hot. There has been very little rain.” Report for
May 1836.

“There have been, during this month, four deaths, as follows :—9th Lancers, Piershill.—Private Nathaniel Watt died on the 13th June, thirty-one hours after admission into hospital, of gastritis. During this short time, as appears from the post-mortem appearances, the disease had advanced very rapidly, and made great havoc on the coats of the stomach. There appears from Mr Colclough’s account, to have been during the month a considerable deal of acute disease in the 9th Lancers. There were admitted thirteen cases of febris continua communis. This is probably to be imputed to some irregularity amongst the men in coming into a new quarter. 14th Light Dragoons, Glasgow.—There are no fewer than three deaths in this regiment. Smallpox has prevailed to a considerable extent in the 96th at Glasgow. Scarlet fever has continued to prevail in the city (Edinburgh) during the month. Weather fine ; a considerable quantity of rain.” Report for
June —

“There have been two deaths during the month, and both in the 9th Lancers, viz. Corporal William Lacy, from pneumonia, and Michael Nowland, from Cynanche trachealis. Six cases of smallpox remained in the 96th Regiment. The weather has been remarkably wet, there having been rain, frequently heavy, in 22 days during the month.” Report for
July —

Report for
Aug. 1835.

“This is a lower estimate of sickness than I have ever known among the troops serving in Scotland. The troops, as I have already stated, are at present in this command uncommonly healthy. The civil population in this neighbourhood are also very healthy. Temperature on the 11th August was 74° .”

Report for
Sept. —

“I am not aware of the existence of any epidemic disease among the civil population, although cases of common fever are occasionally occurring.”

Report for
Oct. —

“Private William Hutcheons, 9th Lancers, of typhus, a statement of which is given in Surgeon Colcough’s reports. From the stormy and cold state of the weather, there has been a considerable increase of catarrhal complaints. The mercury in Fahr. thermometer, was lately in Edinburgh so low as 21° ,—a very unusual occurrence at the season of the year.”

Report for
Nov. —

“Private Charles Saddler, from delirium tremens; this man was an assistant farrier and a great drunkard. Catarrhal complaints have been more numerous, as will appear by the return, than during the summer and autumn, and this class of disease may be expected to be frequent for a few months.”

Report for
Dec. —

“Common continued fever and catarrh have been unusually frequent during this month, which may, in a great measure, be attributed to the inclemency of the weather, and partly to the irregularities that frequently take place among all classes of people at this season of the year.”

Report for
Jan. 1837.

“The prevailing disease during the month, among the troops, has been, as will appear by the return, acute catarrh (Influenza). The total number treated for this complaint is 261, and of this number one case has terminated fatally, and 39 remain in hospital. Influenza has been very general among the civil population of Scotland, during the winter. All ages, and both sexes, seem to be equally liable to the complaint. It has been fatal to a great number of aged persons, and to individuals who had formerly suffered from disease of the lungs.”

Report for
Feb. —

“The prevailing disease among the troops has been acute catarrh, which, however, has been greatly on the decline, there being a reduction on the admissions of two-thirds. The total number treated for this complaint is 88;

and no case has terminated fatally. Influenza likewise has been rapidly declining amongst the civil population."

"Acute catarrh still continues the prevailing disease among the troops. It is, however, on the decline, the admissions during the month being only 36. The admissions in February were 88. Report for
March 1837.

Several cases of common continued fever have occurred in the 79th Regiment at Glasgow, none of them have proved fatal.—This disease prevails to a great extent in Glasgow and its neighbourhood."

"Of the troops quartered in Scotland, the 42d Highlanders, stationed in the Castle, are by far the most healthy, both in point of numbers and the quantity of sickness. The regiments stationed at Glasgow, the most unhealthy, considered numerically, and in point of the severe nature of the cases. According to the report from Glasgow; a few cases of typhus appeared there, and others admitted as continued fever, early assumed in their progress the characteristics of the more severe disease." Report for
April ———

Let it here be remarked, that scarlet fever, in May and June, and common continued and acute catarrh, in December 1836, and January, February, and March 1837, with the addition of influenza over all Scotland in January 1837, prevailed among the civil population of Edinburgh. On the other hand, August 1837 is marked as the *healthiest month to have ever occurred within the knowledge of the Staff-surgeon*. In that month, irrigation is in full operation. In April 1837, it is noticed that the regiment in Edinburgh Castle is the healthiest in the whole command, Glasgow the most unhealthy.

TABLE VI. From 1st May 1837 to 30th April 1838.

14TH LIGHT DRAGOONS, AT PIERSHILL EDINBURGH.							9TH LANCERS, OR LIGHT DRAGOONS, AT GLASGOW AND HAMILTON.						
Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.	Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.
			Com.	Int.	Typ.					Com.	Int.	Typ.	
298	378	2	14	...	...	126	300	364	3	73	...	6	121

INFANTRY REGIMENTS.

STATIONS.	Strength.	Sick.	Dead.	FEVERS.			Ratio of Sick per 100.
				Com.	Int.	Typ.	
Edin. Castle, .	703	587	7	32	...	...	83
Glasgow, . .	708	589	24	61	...	15	83
Stirling, . .	166	219	3	...	...	...	131
Paisley, . .	171	197	3	...	...	...	115
Dundee, . .	185	287	1	...	...	...	155
Fort-George, .	204	349	7	...	...	...	171

Here the proportion of sick at Piershill, and Glasgow and Hamilton, stands 126 per cent. for the former, and 121 for the latter; deaths in the former 2, latter 3. But the most striking difference hitherto in number of fever cases takes place in this period, there being at Piershill 14 common, while there are at Glasgow and Hamilton no fewer than 73 common fever, and 6 typhus, or 79 in all.

Among the infantry stations the minimum of the whole troops, is 83 per cent., which is in both Edinburgh Castle and the city of Glasgow, these being both equal, and the maximum is 171, which is at Fort George. Edinburgh Castle and Stirling Castle are almost identical, both being surrounded by an open country, and the garrisons detached from the cities and possessing high elevations on rocky eminences. Yet they form, the one the lowest, and the other nearly the highest, proportion throughout all the country; while the city of Glasgow is on a par precisely with even Edinburgh. A similar contrast occurs between Dundee, 155 per cent.—or Paisley, 115 per cent., and Fort-George, which is 171; the latter, though a highland district, being above these two manufacturing and populous districts in the proportion of 16 per cent. as to Dundee, and 56 as to Paisley. So much for the attempt to fix on locality by which to test the extent of sickness.

The "Observations" for this period are as follows:—

"One-third of the admissions have been by acute catarrh and continued fever. Six cases of typhus were treated in the 9th Lancers stationed at Glasgow, and three of rubcola

in the 42d Highlanders at Edinburgh Castle. The remaining admissions appear to be of an ordinary nature, though measles and scarlatina are prevalent in the civil population, yet the troops do not appear to have suffered from either. The troops stationed at Glasgow continue the most unhealthy, both in point of the numbers admitted, and the severe form of disease. The 79th Regiment admitted 85 men during the month, and the 9th Lancers, whose strength is 302, admitted 44 into hospital, whilst the 42d Highlanders stationed in Edinburgh Castle, 702 in number, only admitted 34 sick. There have been eleven fine days during the month : rain, hail, and snow, fell eighteen days. High winds for two days from south-west."

"Weather unusually fine," &c. The admissions during the month of June have been, as in the preceding one, chiefly by acute diseases to which soldiers are every where liable, from the nature of their duties, without any appearance of prevailing epidemic. In this month the troops made their customary change of quarters. The 79th now occupy the Castle of Edinburgh, and their sick has been reduced by about a third, while the 42d which took up the quarters of the 79th at Glasgow, have their admissions nearly doubled. It appears, that in the fatal case of asthma which occurred in the 14th Light Dragoons, the lungs were found adherent, the heart enlarged more seriously than usual within the pericardium, and the liver was reported to be enormously enlarged." Report for
June 1837.

"Weather moderately warm, &c. The admissions during July have been nearly 100 less than in the preceding month. The cases also were of a milder form, and deaths reduced," &c. Report for
July —

"Weather in general fine—winds prevalent from westward, &c. The diseases which were common have been continued fever at Glasgow, and diarrhoea, attended with bilious vomiting, generally over the stations in Scotland." Report for
August —

"Weather generally very fine, &c. Bilious vomiting and bowel complaints, and fever with typhoid character, prevailed among the inhabitants of Edinburgh and its adjacents. Common fever, to an unusual extent, was rife Report for
Sept. —

among the garrison at Glasgow, which appears, however, to have been of a mild form, as no deaths are returned under this head from that quarter. The troops stationed in the Castle and at *Piershill Barracks* have been healthy during this Report."

Report for
Oct. 1837.

"Weather in general fine, &c. Fever has been prevalent among the inhabitants of Edinburgh for some time past, and it appears from the report of Dr Paterson, 42d Regiment, that it has prevailed in Glasgow to a great extent during the month. The troops were, however, comparatively, very healthy."

Report for
Nov. ———

"Weather, principally rainy, with heavy gales of wind from west and south-west, &c. Typhus fever has prevailed, and still continues to a great extent among the civil population of Edinburgh and Glasgow, *from which the troops have enjoyed almost an immunity*. Simple continued fever has been the chief admissions during the month, of which, the 9th Lancers stationed at Glasgow, had more than a fair proportion according to their number."

Report for
Dec. ———

"Weather unusually mild for the month of December, &c. Typhus, scarlatina, and anginosa variola, were the prevailing diseases among the civil population of the two great towns Edinburgh and Glasgow, and these diseases are still prevalent, but on the decline. Among the troops, common continued fever and catarrhs formed a third of the admissions."

Report for
Jan. 1838.

"The weather, during the entire month of January, has been intensely cold in Scotland, high winds from east and north-east, &c. Notwithstanding this long continuance of severe weather, the health of the troops throughout the various cantonments has been but little affected. The admissions, though more numerous than last month, are remarkable for being comprised under diseases of a trifling nature, whilst the more grave forms of sickness which incur the risk of life, are very few in number. The phlegma and acute catarrh constitute a third of the admissions during the period of this report. The 14th Light Dragoons notice, in the monthly report for that regiment, the tendency of wounds to be affected with erysipelas during treat-

ment in the hospital of their present station, Piershill Barracks."

"The weather unusually severe, wind north-east. The health of the troops, however, has not been affected by this inclement season. The admissions have been considerably less than in preceding months, and with the exception of a few sporadic cases of typhus, of no very grave character. The 14th Light Dragoons have suffered one death from hydrothorax."

Report for
Feb. 1838.

"Weather severe at beginning of month and winds from north-east, &c. The troops stationed *in Edinburgh* have been healthy. Their return contains no fatal case during the month. The 9th Lancers at Glasgow, in like manner, have no admissions of unusual character, and no deaths recorded; whilst the Infantry Regiment, the 42d Highlanders, in the same cantonment, has admitted a great number of severe cases, viz., 18 of typhus, 2 of pneumonia, and 5 deaths have occurred under the head of these diseases alone. The surgeon of the 42d, however, reports that typhus has disappeared in his Regiment. The 91st depot, quartered at Paisley, has treated also 5 cases of typhus, among which 1 fatal has happened."

Report for
March —

"Weather damp and cold during day, frost at night, wind east and north-east, &c. The Regiments stationed *in and about Edinburgh*, have been healthy, typhus having altogether disappeared among the troops in this station. The assistant-surgeon of the 14th Light Dragoons died during the month, &c. The troops at Glasgow are also healthy, and those in the country particularly so."

Report for
April —

A perusal of the foregoing observations for this period, suggests some striking contrasts between the different stations. Glasgow, in the report for May, is stated to be, during that month, the most *unhealthy* both *as to the numbers* of sick and severity of disease. In the the Report for June, the two Infantry Regiments, which changed places in Edinburgh and Glasgow stations, exhibit a marked disproportion, and are contrasted by the Staff-surgeon, the Regiment from Glasgow having their sick reduced by *one-third* on coming to Edinburgh Castle, while the Regiment which

left Edinburgh had their sick *doubled* in Glasgow. In the Report for September, though typhus fever and bilious vomiting, and bowel complaints are reported as prevalent among the *inhabitants* of Edinburgh, special mention is made of *Piershill Barracks* and Edinburgh Castle as *having been healthy*. In the reports for October, November, and December, common fever, typhus fever, scarlet fever, &c., were prevalent to a great extent among the civil population of Edinburgh, and also of Glasgow, but it is added that the "troops were *very healthy*, and that they enjoyed immunity."

TABLE VII. From 1st May 1838 to 31st March 1839.

PIERSHILL.							15TH HUSSARS AT GLASGOW AND HAMILTON.						
Strength.	Sick.	Dead.	FEVERS.			Ratio per 100.	Strength.	Sick.	Dead.	FEVERS.			Ratio per 100.
			Com.	Int.	Typ.					Com.	Int.	Typ.	
315	301	2	24	...	...	95	300	256	6	11	...	...	85

INFANTRY REGIMENTS.

STATIONS.	Strength.	Sick.	Dead.	FEVERS.			Ratio per 100 of Sick.
				Com.	Int.	Typ.	
Edin. Castle,	702	645	8	11	...	...	91
Glasgow, .	678	739	14	59	...	5	108
Stirling, .	214	255	2	...	...	...	119
Paisley, .	215	249	1	...	...	...	115
Dundee, .	170	295	...	...	...	...	173
Aberdeen, .	196	216	...	...	...	...	110

"Observations" for this period.

Report for
May 1838.

"Weather in general cold and rainy with easterly winds without interruption. Vegetation in consequence backward, &c. The troops have been all in movement this month, changing cantonments; which causes the admissions to be apparently more numerous than in reality.

Report for
June —

"Weather in general rainy with cold east winds and heavy fogs, &c. No unusual sickness has been treated du-

ring the month of June. The admissions were chiefly catarrhal colds, phlegms, &c., and no death has occurred among the troops during the period of this report.

“The weather during this month has been moderately warm, &c. The troops healthy without the prevalence of disease in any of the cantonments, the sickness being of the ordinary nature to which soldiers are liable. Report for July 1838.

“The weather during the month has been cold with the prevalence of winds from westward, rain fell more or less for eighteen days, &c. The troops in Scotland have been, however, healthy. A third of the admissions have been by venereal affections of different forms, of which Edinburgh has furnished the greatest proportion of cases. No epidemic disease appears to have prevailed in the various stations of the troops in North Britain. Report for Aug. —

“Weather fine, &c. The troops in North Britain have continued very healthy, no epidemic having prevailed during the period of this report. The admissions have been about the same as last month in point of number, but no cases of a grave character have been treated. Report for Sept. —

“Weather, first eight days mild, afterwards much rain, and severe storms of rain from NW. and SW., &c. An epidemic fever commenced at Glasgow early in the month, and visited Edinburgh about the middle thereof. It still continues to prevail extensively at both places; the symptoms set in mildly, without any remarkable local affection, assuming the typhoid form towards the close, and in children the remittent one from the beginning. The progress of the disease has been tedious in all cases, though not as yet very destructive of human life. With the exception of the 78th Regiment, stationed at Glasgow, *the health of the troops does not appear to be affected by the presence of this epidemic.* In that corps, thirteen cases of fever have been admitted during the month, which evidently were mild in their form, as the greater number have been discharged cured in the same period.” Report for Oct. —

“Weather wet and stormy; winds prevailed from E. and NE., &c. There has been no unusual sickness amongst the troops, and but *a few cases of fever*, though *typhus* has Report for Nov. —

affected the inhabitants of Edinburgh and Glasgow to a great extent."

Report for
Dec. 1838.

" Weather generally fine ; westerly winds prevailed, &c. By the Reports there does not appear to be any unusual sickness. Fever and variola are still prevailing."

Report for
January
39.

" Weather changeable and stormy ; heavy gales of wind ; snow, frost, and rain, &c. No unusual sickness has prevailed among the troops during the period of this Report. The Reports from the various cantonments are favourable. The admissions were chiefly catarrh, phlegmon, and venereal affections."

Report for
Feb. ———

" The weather has been in general cold and changeable ; snow, severe frost, and violent gales, &c. It appears from the Report of the 15th Hussars, that a sudden invasion of rubeola has taken place among the women and children of that corps at Glasgow. None of the soldiers, however, have suffered from it.

Report for
March ———

" The weather has been in general cold and ungenial ; several falls of snow, with severe frost, easterly and north-east winds, frequent rain, occasional snow and hail, &c. The troops throughout the command continue healthy. No case requiring remark has occurred during the month."

In the observations for October, special notice is taken of an epidemic fever having broke out at Glasgow in the beginning of the month, and appeared at Edinburgh in the middle of the month. But it will not fail to be observed, that, with *one exception*, the health of the troops was not affected by the epidemic. The exception is *not* Piershill, but the infantry station at Glasgow. In the case of adults, this fever assumed the typhoid, and in children the remittent form. Hence, according to the *medical doctrines* in the Police Pamphlet, the irrigated meadows at *Piershill* should have furnished an alarming example of this fever in the soldiers and their children. But *the fact* is the *reverse*. The same fact appears recorded in November, that is, "*no unusual* sickness among the troops, and but *a few* cases of fever, though typhus *has* affected the inhabitants of Edinburgh and Glasgow to a great extent."

This closes the period, viz. from 1832 to 1838 inclusive, adopted by Dr Simpson, the last period including the three first months of the year 1839, and excluding the three first of 1832, for the reason given in the outset, viz. in order to present seven years for as many different cavalry regiments, each being located at Piershill and Glasgow and Hamilton for the entire period of each table.

The year from 1st April 1839 to 31st March 1840, may be added, which brings down the evidence to the present time.

Table VIII. From 1st April 1839 to 31st March 1840.

3D DRAGOONS, AT PIERSHILL, NEAR EDINBURGH.							9TH LANCERS, AT GLASGOW AND HAMILTON.						
Strength.	Sick.	Dead.	Fevers.			Ratio per 100.	Strength.	Sick.	Dead.	Fevers.			Ratio per 100.
			Com.	Int.	Typ.					Com.	Int.	Typ.	
329	298	4	2	1	...	90	303	389	4	29	...	...	128

INFANTRY REGIMENTS.

STATIONS.	Strength.	Sick.	Dead.	FEVERS.			Ratio per 100 of Sick.
				Com.	Int.	Typ.	
Edinburgh Castle, .	693	759	10	7	...	4	109
Glasgow, . . .	555	691	10	37	...	1	124
Stirling, . . .	202	301	5	11	...	2	149
Paisley, . . .	182	244	3	4	...	...	134
Dundee, . . .	243	334	...	25	...	4	137
Aberdeen, . .	162	338	2	16	...	...	208

Here the proportion of sick at Piershill is 90 per cent., and at Glasgow and Hamilton 128; deaths at each, 4; fever cases 3 at Piershill, but 29 at Glasgow.

The "Observations" are as follows:

"The first six days of April were very cold and stormy. Since the 7th, the weather has been very fine, and vegetation rapidly advancing. Typhus fever has been on the increase during the month of April among the civil popu-

Report for
April 1839.

lation at Dundee. Scarlatina and rubeola have all prevailed there to a great extent, and, in a great many cases, proved fatal. Rubeola has also prevailed among the children of the 78th at Glasgow; the disease has been mild, and only one man of the Regiment affected. A number of cases of pneumonia have occurred in that corps, some of them severe; the troops, however, have in general been healthy during the month. In the course of the month, the 7th have been relieved at Piershill by the 3d Dragoon Guards. The 7th left only one sick man behind, a case of hæmoptysis, which terminated fatally in a few days."

Report for
May 1839.

"Weather in general during May dry and mild; N.E. winds prevalent, &c. The troops in Scotland continue healthy, although the admissions are more numerous than for many months previous. The cases are trivial, and partly owing to several of the corps changing cantonments, which generally leads to the transfer of sick from one hospital to another. A number of cases of common continued fever have occurred in the 78th Regiment at Glasgow, but with the exception of two which terminated fatally, the disease appears to have been mild, and mostly all discharged to duty. Typhus fever, scarlatina, and rubeola, continue to prevail very generally among the civil population at Dundee, and the deaths from these diseases have been numerous; as yet, the barracks have not been visited by any one of them."

Report for
June —

"Weather seasonable, &c. Several cases of erysipelas have occurred in the 1st Royals at Edinburgh, and 78th Regiment at Glasgow, &c.

"Rubeola continues to prevail at Dundee, and has made its appearance in the children of the 72d in the barracks there: it has, however, been mild.

"The troops in Scotland in general continue healthy, and, with the exception of the above cases, nothing requiring remark has occurred."

Report for
July —

"The admissions into the hospital in this command have not been more numerous than in the last month, and I am happy to repeat that no epidemic disease prevails to any extent. Weather during the month favourable; SW. winds have prevailed."

“The troops in this command are reported healthy, and no epidemic disease prevails in any of the cantonments. The 1st Royal Regiment and the 78th Highlanders have changed quarters during the month, and, notwithstanding the transfer of sick, consequent upon this change, the admissions have not been so numerous, in proportion to the strength, as for many months preceding.” Report for
August 1839.

“The weather has been very unsettled, with much rain, but this had no unfavourable effect on the health of the troops, &c. No disease has been prevalent in an epidemic form, and the total number of sick has been less than the preceding month. The febrile cases have been of a mild character, only two cases of typhus are returned, one at Dundee, and one at Edinburgh, *both contracted in lodgings*. The inflammatory affections of the chest have not been numerous or severe.” Report for
Sept. —

“The troops have continued remarkably healthy, the total number of sick treated is somewhat greater than in the preceding month, which has arisen from the increase of venereal complaints, particularly in the Royal Regiment at Glasgow. The cases of fever have been few, and of a very mild character. Rheumatism, and catarrh, and diarrhoea, have contributed the bulk of acute cases admitted, but have nowhere exhibited any character of severity, and readily yielded to the usual remedies.” Report for
Oct. —

“The weather, during the month, has been generally cold and wet, with a few days’ frost, and some snow towards the end. The health of the troops continues good, and serious cases of disease not numerous. A few cases of fever, with typhoid symptoms, have appeared, one in the 78th, at Edinburgh; two in the 91st, at Aberdeen; one in the 78th, at Dundee. All these, however, have done well, except in one instance, at Aberdeen, where serious fears are entertained of an unfavourable result.” Report for
Nov. —

“The diseases which have appeared among the troops during the month have been generally mild, and readily yielded to treatment. Scarlatina, which was rather prevalent in the depot of 72d Regiment at Dundee during the preceding month, has nearly disappeared, only one case has been admitted.” Report for
Dec. —

Report for
January
1840.

“ The weather during the month has been generally cold ; with much rain for a few days, there was severe frost and snow, &c. There has been no great increase in the numbers of sick at any of the stations beyond the usual average, except at Dundee, where sore throat, catarrh, and bronchial inflammation are stated to have been numerous, but without any fatal results, although in two instances the affection of the pulmonary organs was attended with typhoid symptoms.”

Report for
February
1840.

“ Two cases of variola occurred in the 78th at Glasgow, and one in the 71st at Stirling. In the two first it is stated that the disease was in a modified form, and in the other very mild ; in all, the patients are reported previously to have undergone vaccination.”

Report for
March 1840.

“ The troops have been healthy at all the stations. The cases of fever that occurred were generally mild, and all did well, except in one instance in the 71st depot at Stirling.”

It will have been noticed that in the observations for June several cases of erysipelas are stated to have occurred in the 1st Royals at Edinburgh Castle. According to Dr Liston (Police Pamphlet, p. 34 Piershill, as being affected by the Meadows, ought to be the more natural station for that disease ; but *the fact* is the reverse. Rubella is also mentioned to have broken out in the children of the regiment in Edinburgh Castle. Those at Piershill are not stated to have been affected. In the observations for May, the circumstance of the corps changing cantonments is stated to account for the “ admissions ” or sick being more numerous than in other months. In point of fact, those in the cavalry at Piershill that month, are fewer than the admissions in the cavalry at Glasgow. In the rest of the months the troops at all the rest of the stations are stated to be healthy.

In order to bring the whole annual results of these tables into one view, so as to exhibit the total amount of strengths, sicknesses, and deaths, with fever cases at each station during the seven years, the following table may be given.

TABLE IX. *Shewing the total Annual Sickness, Mortality, and Fever cases, first among the two CAVALRY Regiments, and next among the INFANTRY Regiments, for the whole seven years from April 1832 to 31st March 1839, inclusive.*

1st, CAVALRY.

PIERSHILL.							GLASGOW.						
	Strength.	Sick.	Dead.	FEVERS.			Strength.	Sick.	Dead.	FEVERS.			
				Com.	Int.	Typ.				Com.	Int.	Typ.	
1832 to 1833	321	226	5	13	...	...	289	522	8	15	...	...
1833 to 1834	321	415	7	23	1	...	329	405	7	36	1	...	
1834 to 1835	293	262	6	20	2	...	315	320	3	6	...	...
1835 to 1836	298	213	4	4	...	...	296	349	3	34	...	...
1836 to 1837	290	351	6	41	...	2	299	359	14	47	...	1	
1837 to 1838	298	378	2	14	...	...	300	364	3	73	...	6
1838 to 1839	315	301	2	24	..	...	300	256	6	11	...	...
	2136	2146	32	139	3	2	2128	2575	44	222	1	7	

2d, INFANTRY.

EDINBURGH CASTLE.						
	Strength.	Sick.	Dead.	FEVERS.		
				Com.	Int.	Typ.
1832 to 1833	586	813	7	8	...	1
1833 to 1834	678	750	14	38	1	0
1834 to 1835	744	846	12	49	19	1
1835 to 1836	826	445	11	16	1	...
1836 to 1837	557	484	4	28	...	...
1837 to 1838	703	587	7	32	...	...
1838 to 1839	702	645	6	11	...	...
	4796	4570	63	182	21	2

GLASGOW.						
	Strength.	Sick.	Dead.	FEVERS.		
				Com.	Int.	Typ.
745	896	13	10	2	...	...
696	873	10	34	4	...	...
699	854	12	47	...	...	...
684	647	13	42	3	...	...
673	835	26	79	...	...	...
708	589	24	61	...	...	15
678	739	14	59	...	...	5
4883	5433	112	332	9	20	...

PAISLEY.						
1832 to 1833	253	192	4	...	3	...
1833 to 1834	260	282	3	40	...	...
1834 to 1835	225	197	2	8	...	...
1835 to 1836	176	265	6	9	...	...
1836 to 1837	...	...	...	...	...	...
1837 to 1838	171	197	3	...	...	...
1838 to 1839	215	249	1	...	...	...
	1300	1382	19	57	3	...

STIRLING.						
280	262	5	7	...	...	...
238	380	5	49	...	...	5
212	216	2	2	2	...	...
210	238	6	4	...	...	...
183	273	6	...	...	...	...
166	219	3	...	...	...	...
214	255	2	...	...	...	...
1503	1843	29	62	2	5	...

2d, INFANTRY—continued.

PERTH.						
	Strength.	Sick.	Dead.	FEVERS.		
				Com.	Int.	Typ.
1832 to 1833	246	379	2	11	...	...
1833 to 1834	250	269	3	20	2	3
1834 to 1835	222	242	2	22	...	1
1835 to 1836	173	155	4	2	...	1
1836 to 1837	171	195	2	...	...	...
1837 to 1838	...	...	...	...	...	...
1838 to 1839	...	...	...	...	...	...
	1062	1240	13	55	2	5

DUNDEE.						
1832 to 1833	202	258	1	21	...	...
1833 to 1834	255	318	...	11	...	...
1834 to 1835	230	175	1	11	...	...
1835 to 1836	...	...	...	...	...	...
1836 to 1837	...	...	...	...	...	...
1837 to 1838	185	287	1	...	...	...
1838 to 1839	170	295	...	...	...	...
	1042	1333	3	43		

BERWICK.						
1832 to 1833	266	223	1	6	...	1
1833 to 1834	242	162	3	...	...	15
	508	385	4	6		16

ABERDEEN.						
	Strength.	Sick.	Dead.	FEVERS.		
				Com.	Int.	Typ.
235	260	3	4	...	...	...
238	277	2	11	...	...	1
233	227	4	7	...	...	...
197	213	2	2	...	...	...
...
...
196	216	...	...	...	...	...
1099	1193	11	24			1

FORT-GEORGE.						
350	279	0	2	...	...	...
187	311	2	18	...	...	...
176	158	1	1	...	...	...
204	89	...	...	...	...	...
207	354	3	...	...	...	...
204	349	7	...	...	...	...
...
1328	1540	13	21			

GREENLAW.						
...
220	305	1	15	...	...	...
220	305	1	15			

Thus the whole strength of cavalry at Piershill, from April 1832 to 31st March 1839, is 2136, sick 2146, deaths 32; and of the cavalry at Glasgow and Hamilton, strength 2128, sick 2575, deaths 44, and so of the other stations.

In order to shew the *number of sick and deaths* among every 1000 men during this whole period, being the test fixed on by Dr Simpson, the following table is given, embracing the same period for all the stations, and shewing also the total fever cases.

TABLE X.

STATIONS.	Strength.	Sick.	Ratio of Sick p. 1000.	Ratio of Deaths p. 1000.	FEVERS.		
					Com.	Int.	Typ.
Piershill, . . .	2136	2146	1004	14	139	3	2
Glas. and Hamilton, . . .	2128	2575	1112	20	222	1	7
Edinburgh Castle, . . .	4796	4570	953	13	182	21	2
Glasgow, . . .	4883	5433	1112	22	322	9	20
Paisley, . . .	1300	1382	1063	14	57	3	...
Stirling, . . .	1503	1843	1226	19	62	2	5
Perth, . . .	1062	1240	1180	12	55	2	5
Aberdeen, . . .	1099	1193	1086	10	24	...	1
Dundee, . . .	1042	1333	1279	2	43	...	...
Berwick, . . .	508	385	943	7	6	...	16
Fort George, . . .	1328	1540	1150	9	13	...	...
Greenlaw, . . .	220	305	1340	4	15	...	...

Thus Piershill shews 1004 sick, and 14 deaths, among every 1000 men. Edinburgh Castle 953 sick, and 13 deaths, per 1000. These show the *two lowest* proportions of sick in *all* the stations throughout Scotland.* Glasgow *cavalry* shews no less than 1112 sick, and 22 deaths per 1000. The *maximum* of sick is 1279 per 1000 at Dundee, being nearly 30 per cent. *higher* than Piershill. Next is Stirling, which is 1226 per 1000, which is more than 20 per cent. above Piershill.

Take now the results proved by these tables, and compare them with Dr Simpson's statements. He makes the average sickness of Piershill during the seven years 1029, and deaths 16 per 1000; and the average of the whole cavalry stations of the United Kingdom is 929, and deaths 14 per 1000.

Now, how do the arithmetical facts stand as proved by the tables?

1st, Dr Simpson's statement of average of sickness and deaths at Piershill is erroneous in itself. By Table No. 10, Piershill Returns exhibit 1004, not 1029, of sick—and 14, not above 15 deaths, *in* every 1000 men.

* Berwick has a lower proportion than Edinburgh Castle, but it includes only two years of the period, and hence can form no criterion.

2d, So far from Piershill being above *all other* collective cavalry stations, it is *very much* lower than Glasgow and Hamilton, being the only other cavalry station in Scotland. By the same Table No. 10, the proportion of this last-mentioned station is 1112 of sick, and 20 deaths, among every 1000 men. This is more than 10 per cent. sick, and 7 deaths above Piershill, and 5 *above* Dr Simpson's average of all the cavalry stations of the United Kingdom.

3d, In absence of the Returns of these other cavalry stations, the infantry stations in Scotland being compared with Piershill, the result is, beyond all question, favourable, in a very high degree, to Piershill station. Edinburgh Castle and Piershill, in fact, have the two *lowest* proportions of sick of *the whole stations* in Scotland during the seven years. They are, respectively, 953 (Edinburgh Castle), and 1004 (Piershill), while *all the others* are nearly 1100 in every 1000 men. Three are within a fraction of 1200, and two considerably upwards of 1200 per 1000, or 20 per cent. higher than the average sickness of Piershill.

4th, The fever cases.—In Piershill the total fever cases during the seven years are 139 common fever, 5 intermittent, and 2 typhus; whereas in Glasgow they are in all 230, or nearly 100 above Piershill, of which 222 common, 1 intermittent, and 7 typhus. Again, in the year 1839–40, the cases at Piershill are 2 common and 1 intermittent; while at Glasgow they are 29 of common fever.

5th, Such diseases as ague, yellow fever, jungle fever, bullam fever, &c., the fearful offspring of marsh, so fully pictured out in the Police Pamphlet, happen to be absolute strangers to these military returns—no such diseases being marked on the lists.

6th, Two other diseases, viz. erysipelas and dysentery, are specified,—the first by Dr Liston, and the other by Dr Hennen—documents under the hands of these gentlemen being quoted, consisting of Lectures by Dr Liston at the North London Hospital, and even of private MSS. of Dr Hennen, “kindly furnished by Sir George Ballingall.” Dr Liston refers to some noted instance of erysipelas, viz. 8 cases in a dragoon regiment in one day, and that imme-

diately after the irrigation was commenced ; and of its having carried off a great part of the men and officers before the regiment left the station. Unfortunately he does not mention the date. Dr Hennen again refers to a singular outbreak of dysentery in 1813.

With a view to more care being taken for the credit of these authorities than Professor Simpson has bestowed, the cases of erysipelas and dysentery have been noted from the returns, not only from 1832, but from 1st January 1830 till March 1840, or ten years, and the following Table shews the whole.

TABLE XI.

	Piershill.		Glasgow.		Edinburgh Castle.		Glasgow Infantry.	
	Ery.	Dys.	Ery.	Dys.	Ery.	Dys.	Ery.	Dys.
1832-33,	3	0	...	...	4	0	3	0
1833-34,	1	0	...	..	2	1	4	0
1834-35,	1	1	...	..	2	0	0	1
1835-36,	...	...	...	...	...	...	6	0
1836-37,	1	1	3	1	3	0	...	...
1837-38,	3	1	1	1	...	...	...	...
1838-39,	3	0	0	1	5	0	4	0
1839-40,	1	0	0	2	5	0	6	3
Total, . .	13	3	4	5	21	1	23	4

	Perth.		Paisley.		Stirling.		Aberdeen.		Berwick.		Greenlaw.		Dundee.	
	E.	D.	E.	D.	E.	D.	E.	D.	E.	D.	E.	D.	E.	D.
1832-33,	1	4	1	0	4	1	...	...	1	0	...	...	...	...
1833-34,	...	...	6	0	...	...	...	...	...	...	3	0	2	0
1834-35,	...	...	1	0	...	...	2	0	...	...	3	1	...	...
1835-36,	...	...	0	1	1	1	1	0	...	...	...	...	...	...
1836-37,	...	...	...	...	1	0	...	...	...	...	0	2	...	...
1837-38,	...	...	1	0	1	0	...	...	...	...	...	...	0	1
1838-39,	...	...	0	5	...	...	1	0	...	...	3	0	1	0
1839-40,	...	...	0	1	2	0	...	...	...	...	0	2	4	4

Thus, during these ten years only 13 erysipelas cases occurred at Piershill, and no deaths in these. Other stations shew as many ; such as Glasgow, which shews 21. The dysentery cases are so few as not to be worth notice.

In reference to the wives and children of the different regiments stationed at Piershill, the following Table exhibits the total number of both.

TABLE XII. Shewing the number of Wives and Children at Piershill Barracks belonging to the Regiments there, from April 1832 to March 1840, inclusive.

	Wives.	Children.
1832-1833,* . .		
1833-1834, . .	82	176
1834-1835, . .	68	162
1835-1836, . .	52	104
1836-1837, . .	40	108
1837-1838, . .	52	60
1838-1839, . .	35	101
1839-1840, . .	56	73
	<hr/> 385	<hr/> 784

Thus, a considerable number of women and children were resident in the Piershill Barracks, or in the village of Restalrig, during these years, and the Medical Reports prove that no unusual unhealthiness or epidemic disease prevailed, although on different occasions diseases of various kinds, peculiarly incident to children, were noticed as affecting the civil population. No wonder, therefore, that Mr Henry Marshall, in his communication to the Police Commissioners, should refer to the health of the wives and children stationed at Piershill, or that this part of his statement is suppressed in the Police Pamphlet.

The inferences from the evidence are,

1. That Piershill, contrary to Professor Simpson's statement, is *not* more unhealthy than all the collective cavalry stations.
2. That Piershill shews a *less* proportion of sickness and mortality than the cavalry station at Glasgow and Hamilton.

* The returns, to which access has been obtained, do not specify the wives and children previous to November 1832, and hence this year is blank.

3. That Piershill shews a far inferior degree of sickness to any infantry station in Scotland.

4. That Piershill shews *fewer cases* of fever than the cavalry station at Glasgow and Hamilton.

5. That in a series of monthly reports for a course of eight years, evidence, partly direct and partly implied, or circumstantial, is afforded in favour of the salubrity of Piershill.

6. No case of sickness or death in the cavalry at Piershill is ascribed to the meadow lands, or has been proved, or is even mentioned in these reports as arising from that cause.

7. That in these reports not a vestige is to be seen of evidence, that the wives or children of the cavalry at Piershill, any more than the soldiers, were visited by disease or sickness of any description which could be ascribed to the meadow lands as a cause.

8. On the contrary, the reports during different years of the period for the last eight years, prove, that while the civil population, and in some instances the children in particular, were affected to a great extent with epidemics, the cavalry troops at Piershill escaped, and enjoyed "immunity."

The evidence now stated sets at rest any question about the salubrity of Piershill Barracks, and demonstrates that the averages relied on by Dr Simpson are a mere fallacy. He ought to have compared one locality in Scotland with another in the same country, instead of referring to annual enumerations relative indiscriminately to the whole stations of the empire, some of which differ so widely from others as to afford no just ground of comparison. This evidence also obviates an objection stated in the Police Pamphlet to that of the inhabitants of Restalrig, viz. that, by long residence near the Meadows, these persons become so *acclimated*, that they escape from the supposed unhealthiness of the locality. Without stopping to inquire into the value of such an objection, the present evidence, while it is of precisely the opposite character, being that of per-

sons resident at Piershill Barracks for a *single year only*, is yet equally conclusive. In other words, some persons live constantly all their lives and reach a great age, others only reside for a year, close to the Meadows, yet all are equally unaffected by their supposed unhealthiness.

In contact with Piershill Barracks is the village of Jock's Lodge, and there is no doubt of the safety of that village as a place of residence. As to the pretences of the Police Committee, that butchers' meat cannot be kept safely in the larder of the barracks, it is unfounded. In the larders of Mr Richardson's, Mr Oliver's, and Mr Miller's houses, meat keeps perfectly well. The larder at Piershill is small, when the size of the barracks is considered, and the number of men occasionally stationed there. It is much exposed to a strong current of sea air when the wind is in the north or east points. This is an important circumstance, of the effect of which the Police Committee and their chairman probably understand nothing.

It can be proved by inhabitants of Jock's Lodge, who have resided there fourteen or fifteen years, such as Mrs Gow, Mrs Thomson, and abundance of others, that they enjoy good health in that village, and that butchers' meat is kept there as long and successfully as in any part of Edinburgh. It is true, the barracks stand on an elevation exposed to the blast from the German Ocean and Firth of Forth, and when the wind is in that quarter, meat is kept less readily, an effect justly imputed to the damp sea breeze, as the same thing occurs at Leith Links and Portobello. In particular, it can be proved by the keeper of the baths at Portobello, that the influence of the sea blast is very great on butchers' meat, more especially when the weather is thick and foggy, and the larder ill ventilated. Nay, that on removing butchers' meat there from a larder on the north-east, when the wind is from that quarter, and bringing it to the opposite side of the house, the result is that it can be much longer kept sound. Experiments to this effect actually were made by Mr Connell in Wellington Street, Portobello, during the month of November last

1839, whereby the fact now stated was distinctly verified. Thus, like all the other statements of the Police Committee, that about the larder at Piershill is shewn to be the product of mere ignorance.

It may here be added, that the agents of one of the proprietors of the meadows having understood that near the town of Maybole in Ayrshire certain irrigations exist, they wrote to a most respectable practitioner of the law there, requesting information on the subject. In their letter they said: “18 Duke Street, Edinburgh, 7th January 1840.—For some time past a sort of clamour and agitation through statements in newspapers has been raised against some water meadows in the neighbourhood of Edinburgh, on the score of alleged unhealthiness in consequence of the water being composed partly of common sewer and drain water of the city. We are agents for one of the proprietors of the lands, who is desirous to expose the unfounded and false statements. We understand that certain lands, the property of the late Quintin Kennedy, Esq., adjoining to Maybole, are irrigated in a similar manner, *i. e.* partly by the water from the town and its sewers. The purpose of this, therefore, is to request information in answer to the following queries:—

Irrigation at
Maybole.

“1. Whether there are lands adjacent to the town which are irrigated by the water of the common sewers or drains to raise water meadows, what is their extent, how near to the town, and how long they have been irrigated?

“2. Who are the principal purchasers of the grass? and whether, as in the case of Edinburgh, these are cowfeeders who supply the town with milk; and if so, whether any complaints ever were or are now made of the milk being unhealthy, or the butter becoming speedily putrid?

“3. Whether the town itself, or more particularly the persons, if any, who live on the meadows, or next to them, have been or are now affected prejudicially to their health by these meadows; and if this has been the case, whether any question or action of law, or any faults by the public generally, have ever been raised or made on the subject?

and still more, if so, whether any medical men have given any opinions on the subject, and what they are ?

“ The information wanted is merely to contrast the case of these lands at Maybole, with the Edinburgh meadows, in the event (which we may safely conclude will be the case) that there is analogy, for, in relation to the latter, the case of the proprietors admits of no doubt, viz. that the complaints and agitation as to alleged unhealthiness, are entirely erroneous and unfounded.”

An answer was returned:—“ Maybole, 9th January 1840,” stating that, “ Maybole, as you perhaps know, is situated on a declivity, the main street being north-east and south-west, and with a rise somewhat like the High Street of Edinburgh. There is still a greater declivity towards the south-east, so that, in looking at the town, it seems to hang on a brae towards the south-east. On this side the declivity terminates in a meadow, the property of the late Quintin Kennedy, and which is not more than 200 yards distant from the most densely populated portion of the town.

“ In answer to your queries, I beg to observe,—

“ 1. That since the memory of man, indeed since Maybole existed (this is beyond doubt, from the relative position of the town and meadows), these meadows have received all the water from the common sewers of the town, and which, at one time, was allowed to find its way through ill made and often choked ditches. But, perhaps twelve years ago, artificial irrigation was adopted, whereby the filth and water of the town (situated as I have described it) has been carried with advantage through the meadows. The meadows thus irrigated may not exceed ten or twelve acres, but the town is bounded on the south-east by meadows alone, not more than 500 yards at any part from the population, and the irrigated portion not more than 200.

“ 2. These meadows are held in lease by two farmers, whose lands lie in the neighbourhood, who both keep a dairy stock, and both are rather famous for the qualities of their butter and milk. We have no idea here that the

grass of these meadows was at all calculated to make the milk unhealthy, or the butter speedily putrid.

“ 3. In answering this question, I beg to observe, that, in *theory*, it is supposed the town would be healthier were there no meadows in its neighbourhood. But the irrigation has not increased the bad effects even in imagination, for no complaints have been made, nor, if made, could they be sustained. The population of the town in 1831, was 4000, and it is most crowded near to the meadows, and must be considerably increased since last census. The whole population of the parish was then 6287, and yet the yearly deaths have never amounted to 2 per cent., and this year only to 1 8-10ths per cent.”

It is said, in the Police Pamphlet, that, in what is called Abbeyhill, the south side of the street adjacent to the foul burn, is a more unhealthy residence than the north side of the same highroad or street. This, if true, has no connection with the irrigation of lands at a distance, and chiefly distant three miles. It may be true that the foul burn here descends from Edinburgh; that the waters of it are defiled by the city, and made much more obnoxious by the refuse of the gas-works. The owners of the inferior territory avail themselves of the stream for irrigation, but neither cause it to exist nor to descend at the south side of the road or street called Abbeyhill, and between that street and Comely Garden or Spring Garden. But, even in relation to this locality, every thing is misrepresented by the Police Committee.

In the first place, it is impossible to pass along that highroad or street, without perceiving that the buildings on the north side of it, including the residence of the late Baron Norton, are in general of a different description from those on the south. They are lofty, substantial, and spacious buildings, situated on elevated ground, and have evidently been constructed by persons, or for the use of persons, of respectable or rather of high station, whereas the buildings on the opposite or south side, adjacent to the foul burn, are in every respect of a different character. They are generally mean buildings, situated on low ground,

and generally constructed obviously for the use of a poorer class of persons.

The statement may or may not be true that a part, and only a part, of the foul burn behind the houses last mentioned, was formerly covered, but is at present uncovered, and that some people there attempt to collect soil from it. Assuredly the proprietors of the distant irrigated meadows have no interest in the alleged proceedings referred to.

But having said this much, let it be observed, that an inquiry has been made how far there is any truth in the averment, that the situation in question is unhealthy, and the result of that inquiry is decidedly unfavourable to any reliance on the Police Committee's pamphlet, or the anonymous newspaper writers by whom the agitation has been supported.

Beginning at Clockmill-bridge, and proceeding upwards, an investigation has been made into the state of the health of the district. It can be proved by *George Lonie*, labourer at Foulburn or Clockmillbridge, already mentioned, who has a family consisting of a wife and four young children, from two to eleven years old, that when they removed thither two years and a half ago, they were in a complaining state, but speedily they became, and have continued, quite healthy. In like manner, John Horsburgh, workman at Meadowbank, who has lived four and a half years at Croftan-righ, close to the foul burn, and recently two years at Foulburn-bridge, has, with his wife, been quite healthy.

The same safety of that neighbourhood can be proved by *Nathaniel Blair*, residing the last three and a half years at Foulburn-bridge, with regard to himself and his wife and a young family of five children. In like manner, *Thomas Scott*, at Clockmill, opposite the bridge, has lived there four years, with a wife and eight children, all in good health. They formerly lived at Roselane, adjacent to the open foul burn, with the same good health. He has been employed thirty years upon the meadows, without injury to his health. His predecessor in his present house was one Honeyman, who lived seventeen years in it, and brought up a family of seven children in that house. It may be

added, that two of the before-mentioned persons, Lonie and Scott, occasionally employ themselves in collecting manure from deposits made by the burn, and Scott occasionally in summer employs to assist him a man who is a sailor. This man has frequently got trifling injuries in his hands and legs, but they healed immediately, without inflammation or inconvenience.

Mrs Brown, Spring Garden, enjoys good health, and brought up eleven children in her present house. Her husband, who died in 1830, obtained from Sir James Montgomerie a long lease of the house. He at one time collected manure from a pool or pond of the burn, but, many years before his death, he discontinued doing so, because unprofitable. There is no unusual bad health known in the houses in Comely Garden. In particular, one house is inhabited by a very old lady, supposed above ninety years of age, who must have resided there above forty years, as she succeeded the late Lord Dundonald, who before that period was resident in the same house.

In short, by Alexander Wilson, gardener, near the Palace, who, during fourteen years, occupied the minister's glebe at the irrigated meadows;—by Mrs Janet Davidson, Fullarton's Close, whose house is next to Comely Garden, where she has lived above fifty years, and brought up five children, all healthy, and where her mother died aged above eighty;—by Mrs Bathie, who has resided, during her life of eighty years, there and in the neighbourhood;—by Mr Francis Gibson, who has lived thirty-two years in the same close;—by Mr Robert Watt, who lived eight years at Foulburn Bridge, and eight in his present residence;—by Mrs Scott, who has lived ten years in the same line of houses;—by Mr Alexander White, who has lived fifty years in or about the same line of buildings;—by Mrs Honyman, a widow who lived with her family fourteen years at Clockmill;—by Mr Francis Jackson, who has lived six years in his present house (and formerly in Brand Place, on the north side of the highway);—by Mr Thomas Samuel, who has lived fifty years with his family adjacent to Comely Garden, and brought up eight children, five of whom are

alive ;—by Mr Wallace, 28 Abbey Hill, who has lived ten years there ;—by Mrs Harkane, Mrs Tait, Mr Alexander Pennycuik, Mr Peter Watson, meal-dealer, Mr John Hunter, grocer, Mr David Thomson, Mrs Hall, Mr Edward Rowley, victual-dealer, Mr William Robertson, Rowley Court, Mrs Davidson, Mr Forrest, Mrs Davis, Mr Peter Hunter, all living in the same court, and by a variety of others too numerous to be recited, but who have all lived during years, some many and others fewer, on the south side of the same high road, it can be proved that they have enjoyed good health, and have suffered nothing in that respect from their vicinity to the foul burn, although some of them express a dislike to the smell, which they justly ascribe to the Gas-works. The statement of the Police Committee is so far true, that Comely Garden was anciently frequented by the nobility and gentry as a place of fashionable resort ; but the property having been acquired by Government, the private resort was interrupted. A great change also came over Edinburgh. The Canongate gradually ceased to be the fashionable end of the town ; the city extended itself chiefly towards the north and north-west, and partly to George's Square on the south, so that this neighbourhood fell into that obscurity that appears to have given courage to the Police Committee to say, recklessly and without inquiry, that the neighbourhood is unhealthy.

But, it may here be asked, Why has not the law been enforced against the Coal-Gas Company for the protection of so many dwelling-houses ? The Commissioners of Police have neglected their own duty, and now calumniate the proceedings of others, and the whole of the ancient and beautiful capital of Scotland.

The Palace. One of the bugbears prominently founded on by the Police Committee is the Royal Palace, in which George IV, the first of British gentlemen, condescended to hold his court in 1822. It is said, that it would form a hazardous residence to Queen Victoria. It is plainly a sufficient answer, that if the village of Restalrig is not rendered unsafe

by the irrigated meadows,—if the Barracks and Jock's Lodge are not an unsafe residence for her Majesty's troops, it is very clear that these meadows cannot prove dangerous to the Royal Palace, from which the larger extent of these meadows is at a distance of nearly three miles, and scarcely a corner of them nearer than one mile. It is true, that a small feeder of the foul burn descends from the south by Lord Haddington's fourteen acres of meadow-grass, but it is at the distance of 250 yards from the Palace. The current of water, or drain, is covered where it passes the Palace along the whole extent of St Ann's Yards, after which it proceeds along the back of the south line of houses already mentioned, of Abbey Hill. It is only in this part of its course that it becomes the proper foul burn, and receives the water from the Gas-works. Now, if this part of the stream near Abbey-hill be offensive to the Royal Palace, why do not the officers of Government remedy the evil by royal liberality? When it is known how many thousands and tens of thousands the city of Dublin has received for public purposes from the British treasury, it would be no high stretch of national munificence to do something for the vicinity of the Royal Palace of Holyrood.

But the complaint about safety to health is a mere fiction. Independent of the longevity and health of the inhabitants of what is called Abbey Hill, let it be remembered that, between the Palace and the Earl of Haddington's meadow-ground, where for some years there has been no pool for collecting manure, there stand a variety of lofty buildings. These buildings are neither untenanted nor uninhabited. The inhabitants of them never could be disturbed by the Earl of Haddington's meadow of fourteen acres; because, as already noticed, it is not connected with the Gas-works, or the feeder into which the liquid discharged from these works proceeds to the foul burn.

The investigation by the proprietors of the irrigated meadows has been extended to the Canongate and St John's Hill. They are prepared to shew that, in relation to that locality, the averments of the agitators are equally un-

founded as in relation to other situations ; but, in adverting to the special statements in the Police pamphlet, some farther notice will be taken of the state of the fact.

The question then returns, What is the cause of the very recent augmentation of typhus fever in Edinburgh ? Why did it not occur during nearly twenty years posterior to 1814 ? The Convener of the Police Committee, and some anonymous writers in newspapers, or agitators at a popular Canongate meeting, say they have discovered that it is all due to the irrigated meadows at the distance of miles. But it has here been demonstrated, that this notion is merely the result of error, presumptuous as usual, because founded in utter ignorance. The proprietors of the irrigation are not bound to find an answer to the question, Why typhus fever has recently augmented in Edinburgh and Glasgow ? If their lands had, as averred, been in a state of *stagnating marsh*, there would have abounded, from time immemorial, ague or intermittent fever in Restalrig and the neighbourhood ; but even in Edinburgh, this is not the form of fever which is said to have recently occurred or increased. A different solution of the question, or explanation of the cause of increased fever, must therefore be found ; and a different and a much more obvious solution has accordingly been found, and stated, and published, by medical gentlemen of undeniable learning and talents. Concerning one of these (Mr Tait, surgeon), Mr Drysdale was pleased most recklessly and untruly to assert, in a public newspaper, that he Mr Tait had been employed by the proprietors of the irrigated ground to prepare an answer to the Police Committee's pamphlet. Did these foolish agitators really imagine, that while, in their ignorance and unfeeling disregard of consequences, they were calumniating the Capital of Scotland and one of the most valuable improvements in agriculture, which affords bread and profit to so many persons, nobody was spontaneously to stand forward to undeceive the public, and to protect the renown and the beautiful locality of the ancient City of Edinburgh ?

It is feared, that the answer is correct which the me-

dical gentlemen already referred to have given to the question, why fever has recently increased in Edinburgh; but whether correct or not, it is sufficient here to say, that it is not caused by irrigation. The answer to the question or the solution given is, that the increase of fever has been caused by infection from disease, originating in the greatest of physical evils,—*poverty*. A writer on a different subject formerly said: “Next to vice and infamy, poverty is the greatest evil that a man can encounter in this world. The man is in poverty, no butcher or baker will feed him, and nobody will clothe him; nobody who knows the fact will let to him a house to shelter him. The physician, the man of the law, will avoid him: nay, poverty is absolutely more infamous than many crimes in the statute-book. Bribers, usurers, gamesters, whoremongers, are all received into the society of the great and the gay; but the man known to be poor is excluded. Surely he is a great criminal, and poverty is a great crime!”

It is now added, apparently with much medical intelligence and sagacity, that truly the fever which has augmented in Edinburgh has been caused by the poverty, that is, the destitute state, of a multitude of poor inhabitants by whom the obscure lanes and closes are tenanted. In those lofty houses which formerly were the mansions of the noble and wealthy, each room or apartment now forms a place of unclean shelter to whole destitute families, who, suffering all the evils of want, fall into sickness, from which infection spreads to those who approach them.

Reference is made to a recent treatise on the “Management of the Poor in Scotland, and its effects on the Health of the Great Towns.*”

Dr Alison, who during many years acted as a dispensary and hospital physician, and thereby was enabled to discover the truth, has, with great ability and much investigation, traced the cause of severe epidemic and contagious fevers to

* By William Pulteney Alison, M.D., F.R.S.E., Fellow, and late President of the Royal College of Physicians, Edinburgh; Honorary Fellow of the King and Queen’s College of Physicians in Ireland; Professor of the Institutes of Medicine in the University of Edinburgh; and one of the Physicians in Ordinary to Her Majesty in Scotland.

poverty. He justly remarks, that "it cannot be overlooked that, from various causes, the expenditure of the higher ranks in Edinburgh, as proportioned to the increasing population, has considerably declined of late years. Almost all the noble families, and many of the gentlemen of the class who formerly had large establishments here, now pass the winter in London. There has been a great reduction in the establishments both of the courts of law, and of the different public boards formerly existing here. The resort to the University has also somewhat declined : many building speculations have turned out unprofitable, the price of houses has fallen very much, and the employment of numerous labourers in the buildings lately carried on here has ceased. Thus, the number of persons who have been thrown out of employment, or whose employment has been rendered irregular and precarious, is very great. (P. 5.)

"The gradually increasing number of women with families, whose husbands have left them in search of work, and often ultimately deserted them, must have struck all who have attended particularly to their condition." (P. 6.)

Dr Alison quotes, from certain public medical reports, an account of the state of the poor in Dublin, and adds, "that I am not singular in thinking that the condition of a large number of the lowest of the people in Edinburgh, whose employment is irregular and precarious, approaches very nearly to that which is thus described in Dublin, will appear distinctly from two short quotations. The first is from a pamphlet by Mr Tait, surgeon and Commissioner of Police, 'On Foul-water Irrigation,' written to shew what is certainly strictly true, that the diffusion of fever in Edinburgh depends on causes acting within the City, much more than on such irrigation of meadows at some distance from it.

"In many of the closes leading from the High Street to the Cowgate, every stair and every vacant apartment becomes the depository of everything that is filthy. One flat alone, situated in Foulis' Close, may give an idea of the extent to which dunghills within doors, and in houses inhabited by poor families, are sometimes carried. However

dirty and confined this close is, it is in many respects superior to Blackfriars' Wynd. Every attempt at a description of the latter would come so far short of the truth, that we must abandon it for the present, in the hope that some curious visitor will, at a future day, contrast its former splendour with its present filthy and wretched condition, and give an idea to the world, to what stage misery and wretchedness may be brought.

"The next is from the evidence given by the Rev. Dr Lee, Minister of the Old Church, before the Commissioners of Religious Instruction, 18th February 1836, on the state of another portion of the Old Town. 'I have seen much wretchedness in my time, but never such a concentration of misery as in this parish.' 'Some of the Irish in it are very wretched, but by far the most wretched are Scotch. I have seen a mother and five daughters with another woman, in a house where there was neither chair nor table, stool, bed or blanket, nor any kind of implement for cooking. She had the largest allowance given by the Charity Workhouse, 2s. 6d. a-week.' 'I frequently see the same room occupied by two married couples, neither having a bed.' 'I have been in one day, in seven houses, where there was no bed, in some of them, not even straw,—I have found people of 80 years of age lying on the boards.' Many sleep in the same clothes which they wear during the day. I may mention the case of two Scotch families living in a miserable kind of cellar, who had come from the country within a few months in search of work. Since they came, they had had two dead, and another apparently dying. In the place they inhabit, it is impossible at noon-day to distinguish the features of the human face without artificial light. There was a little bundle of dirty straw in one corner for one family, and in another for the other. An ass stood in one corner, which was as well accommodated as these human creatures. It would almost make a heart of adamant bleed to see such an accumulation of human misery in a country like this. A description in very similar terms of a third portion of the Old Town, the neighbourhood of the Grassmarket, is given by the late Dr

Hennen in an early volume of the Edinburgh Medical and Surgical Journal. My friend and former assistant Dr Kay, one of the assistant Poor-Law Commissioners, and author of a very instructive work on the State of the Poor at Manchester, states in a letter with which he lately favoured me, that the only parallels he has seen to the wretchedness of the Irish and low Scotch population of Edinburgh, are in the Irish of Manchester and the weavers of Spittal-fields." (P. 11, and 13.)

Dr Alison adds, upon evidence, that a still more rapid increase of destitution has taken place in Glasgow.

After observing that, in certain cases, much fever has existed without poverty, and much poverty without fever, Dr Alison says, "It is not asserted that destitution is a cause adequate to the *production* of fever (although, in some circumstances, I believe it may become such), nor that it is the sole cause of its extension. What we are sure of is, that it is the cause of the rapid diffusion of contagious fever, and one of such peculiar power and efficacy, that its existence may always be presumed, when we see fever prevailing in a large community to an unusual extent. The manner in which deficient nourishment, want of employment, and privations of all kinds, and the consequent mental depression, favour the diffusion of fever, may be matter of dispute; but that they have that effect in a much greater degree than any cause external to the human body itself, is a fact confirmed by the experience of all physicians who have seen much of the disease." (P. 19.)

After shewing from Irish medical reports, that the severe epidemic fevers of Ireland were universally ascribed by the medical profession, to the miserable condition of the poorer classes, and their sufferings from cold and famine, he adds. "That it is always in persons suffering, or who have lately suffered, similar privations and sufferings, and the mental depression and despondency which naturally attend them, that continued fever becomes extensively prevalent, is fully established by the history of all considerable epidemics. The elaborate work of Drs Cheyne and Barker shews that this has been strictly true of all the great epi-

demics which have appeared in Ireland since 1700, each of them lasting fully two years, namely, in 1708, 1720, and 1731, in 1740-41 (after the great frost of 1740), in 1800-1801, after the rebellion, the transference of the seat of government to London, and the scarcity of 1799 and 1800, and again in 1817, 'after the transition from the state of war to that of peace,' and the scarcity of 1816 and 1817. That work contains reports from the most eminent physicians in all parts of Ireland on that great epidemic, all agreeing in the statement that '*the poor were the greatest sufferers, and the fever seemed to rage among them in a degree proportionate to the privations they had endured.*' In Ireland, accordingly, at least during the present century, as the general condition of the poor has been decidedly worse than either in England or Scotland, so contagious fever has never ceased to be more generally prevalent. The same observation applies to the epidemic fever in London after the scarcity of 1800 (the last great epidemic which has occurred there),—to the great epidemic continental fever of 1813 and 1814, which followed the track of the French army retreating from Russia, but never made much progress in the victorious allied army,—to the epidemic fever of 1817 in Italy, consequent on the scarce year of 1816,—to the epidemic which affected the British army in Holland, after the disastrous retreat from Flanders in 1794,—in Portugal, after that from Burgos in 1812,—and to that which nearly decimated the British Legion at Vittoria in 1836." (P. 21.)

That the same cause has acted very powerfully in producing the recent epidemics, both in Edinburgh and Glasgow, appears distinctly from two considerations.

"*First*, It appears from observing the times of these epidemics, the first in Edinburgh, beginning in 1817, after two bad harvests, and at the same time as the Irish one; the next in 1826, after the great failures in 1825, and the sudden cessation, particularly of building speculations in Edinburgh; and the last in 1836, after the great depression of trade both in Glasgow and Dundee, with which towns the lower orders here are much connected, and under

the combination of other circumstances already mentioned, which have depressed the condition of the poor in Edinburgh of late years. In Glasgow the evidence of the operation of this cause is still stronger; fever seems to have increased and diminished for forty years past, nearly as it did in Edinburgh, until the year 1836, when, after the great stagnation of trade, it became much more formidable. For twenty years before 1815, when the town was rapidly increasing in wealth, the number of fever patients in the Infirmary never exceeded 130 in the year. In the three years 1817, 1818, and 1819, it amounted to 2715, or 905 in the year. It then diminished considerably, but rose after the failures in 1825, and in 1826, 1827, and 1828 amounted to 3520 or 1173 in the year. There was another increase of the disease in 1832; and after the great failures in 1835, it spread so extensively that the numbers taken into hospitals in 1836, 1837, and 1838 amounted to 9740, or 3270 in the year, and of these, 5387 were in the year 1837 alone. The hospital accommodation in Glasgow has long been much less adequate to such extension of fever than that in Edinburgh, so that I believe in all the epidemics, 'numerous applicants for admission have been thrown back on their own resources, and left to spread the contagion of typhus around their miserable dwellings;' and in the last three years, the whole number of cases of fever in Glasgow, is computed at nearly 40,000; and the deaths from it are stated in the mortality bills to have been 3835, of which 2180 were in the year 1837 alone.

"*Secondly*, The same thing appears from the observation which I have myself made many hundreds of times in the old town of Edinburgh, that it is among those of the poor who suffer the greatest privations, whose employment is precarious, often suspended, or little profitable, and among disabled men, 'lone women,' widows, and orphans, especially among the poor Irish, or other strangers of this description, that fever most frequently appears, and always spreads most rapidly and extensively.

"These facts point to so intimate a connection between contagious fever and destitution, that I have no doubt, we

shall very constantly find, in regard to all large towns, where the structure of society is complex, that if the condition of the poor is very bad, fever will be prevalent, and if that be tolerably comfortable, it will be comparatively rare. This contrast is remarkably observed on comparing the great towns of England with those either of Scotland or Ireland." (P. 23.)

Without multiplying quotations, it may be sufficient to refer to the work in question, which very conclusively shews that the cause which has augmented fever in Edinburgh is very different from the existence of agricultural irrigation, chiefly at the distance of miles from the city.

Remarks on some of the Special Statements in the Police Pamphlet.

The pamphlet commences with an introductory dissertation p. 7.
tation by the chairman of the committee.

Here the two first pages demonstrate the absurdity of the whole. The import of the defence against Mr Duncan's action is misrepresented, and the irrigated meadows are falsely described as "*stagnant marshes*." The Commissioners of Police are next applauded for their *anxious wish* "to abate this nuisance." The justice of this complimentary statement has already been sufficiently exposed, and the promoters of the bill of 1834 will scarcely thank Mr Drysdale for reminding the community that they imposed burdens on the inhabitants of Edinburgh to the amount of above L.4000, in an attempt to enlarge their territory, in order *inter alia* to establish stagnant pools or tanks. The conduct of the Commissioners has already been adverted to in relation to the Police Bill of 1837, in which they *voluntarily* inserted the protecting clause, thereby demonstrating their conviction of the vested right of the proprietors to use the stream passing through the inferior territory, and their acquiescence in that right. Next, however, it is now alleged, that individuals have intimated an intention to leave Edinburgh from fear of Mr Drysdale's pretended *marshes*—an averment probably just

as true as that about the anxiety in 1834 of the Board of Police for the protection of the city against nuisance. The important statement next appears, that an attempt is to be made to prevail with Government to bring forward a public statute against irrigation, and in order *to instruct* the officers of Government the pamphlet is printed. The introductory statement is closed with mention of the powers now to be demanded by the Commissioners of Police. On these, some remarks will presently be made.

In the mean time, this committee and their chairman must truly have a high notion of their own wisdom, or a mean opinion of the sagacity and intelligence of the present British Government, or, as they are called, "the officers of the Crown," if it be supposed that this pamphlet will enlighten the Government, or that Government will take for its instruction a train of anonymous lucubrations in the Edinburgh newspapers, the speeches of some vain or interested individuals at a meeting in the Canongate, or even the speculative opinions said to have been obtained, but not fully published, of about a dozen out of 270 medical men, relying on an averment which is utterly unfounded, that land rendered profitable by the art of agricultural irrigation is a marsh, a *stagnant marsh*, a *stagnant swamp*, &c. Mr Drysdale has, no doubt, crammed his doctors and his counsel learned in the law with this false averment, suppressing the powers of the Commissioners of Police relative to the Gas Company, and so opinions have been obtained favourable to himself and his agitators. As a writer to the Signet, and once a practitioner of the law, Mr Drysdale knows that it is sometimes possible to obtain a very erroneous opinion of counsel. It is only necessary to invent a suitable story. If it be stated that A intentionally destroyed B by poison, counsel will undoubtedly say that, according to law, A will be hanged. But if the fact be that B is alive and well, of what value will the said opinion of Counsel be. In like manner, let the chairman of a Police Committee tell the doctor that there is a stagnant marsh of great extent in the vicinity of a village or

town, and the doctor will tell him that the situation is unhealthy. Were he to tell the truth, that the neighbouring village has by experience been found to be a healthy residence, and that no marsh exists, the doctor's opinion would evidently be different, but unsatisfactory to a faction of agitators, for which reason, they must adhere to their calumnious averment of the existence of stagnant marshes.

Next, the pamphlet contains quotations from a book ^{P. 13.} called the "Cyclopedia of Practical Medicine," upon the effect of marshes in producing malaria, and the mysterious effect supposed to exist, called *miasma*. As the whole of these quotations, and others from Dr Copland, amount to speculations on the effect of stagnant marshes, it is plain from the remarks formerly made, that these quotations have no bearing on this case, in which marshes do not exist. Indeed, if the Chairman of the Committee had read with tolerable attention his own pamphlet, he would have learned from Dr Combe and others, that when ill-drained ground existed in the plain to the westward of Edinburgh, agues or intermittent fevers were thereby produced which no longer occur since the land in that quarter has been drained. As such fevers are not of the character, *type*, or description of those from which Edinburgh has suffered, and as they do not, and never did, exist in the neighbourhood of the irrigated meadows, the quotations given from speculative writers are here altogether out of place. (P. 13.)

Next there is paraded from the Edinburgh newspapers a ^{P. 17.} series of letters by some unknown person, under the subscription of "Al Hakim." (P. 17.) Such documents may serve the temporary purpose of restless or interested agitators, but it is impossible to suppose that upon men of sense they will have the slightest influence. From first to last, they rest on the same false averment that Edinburgh is surrounded by marshes, or a swamp of about 2000 acres. (P. 22.) Again and again, as formerly noticed, the irrigated meadows are styled a "pestilential swamp," and the words marshes and marshy district are incessantly repeated. Reference is made to "the influence of flax and hemp steep-

ing, and the cultivation of rice." It has been already explained, that agricultural irrigation in our northern climate, or indeed in any climate, has no resemblance whatever to the cultivation of rice, which takes place in a stagnant pool, and as to flax and hemp, nobody in Scotland ever heard of typhus fever produced by the steeping of these crops. It is in vain, therefore, that reference is made to the number of fever patients in the hospitals of Edinburgh. The agitators fail to shew a connection between the typhus or other continued fever of the hospital, with the irrigated meadows, except by the unfounded averment that the meadows are marshes, and that marshes produce intermittent fevers, and almost all other evils set in array by this anonymous letter-writer in the newspapers.

P. 27. Next in the pamphlet (P. 27) comes what is styled "Medical Evidence," and here there is good reason to complain, not merely of the want of the full statements of the medical persons referred to in the precise terms employed by them, but of the suppression of statements of a directly opposite character by other medical persons. The first brought forward is Dr Peebles, who is twice introduced. (P. 28 and P. 46.) In the first of his communications he talks, like the other supporters of the present agitation, of the effect of *marshy* situations, and makes reference to Italy, saying, that "the inundations of the rice fields in some parts of that country are well known to be prejudicial to the health of the population." Now, what earthly connection has this statement with the present case? Is rice cultivated by the tenants of the Earl of Moray or of Mr Miller? It has already been explained that in Italy the governments prohibit the cultivation of rice in the neighbourhood of large towns, whereas they permit agricultural irrigation in the vicinity of their finest cities, and even with the soil that proceeds from these cities.

In his second communication, which had been addressed to the Lord Advocate, Dr Peebles not unreasonably advised that the whole of these grounds should be "well drained and cultivated." But this just proves that Dr Peebles was altogether uninformed concerning the subject

about which he was writing. He had been told a story about marshes, and very judiciously advised that they should be drained. He did not know that the subject referred to consisted of irrigated meadows, which of necessity must have been drained, or be of a quality like sea-sand to require no draining, before they could be put under the valuable agricultural process of irrigation.

Next follow some remarks by Dr Traill, from whom the P. 29. Chairman of the Committee seems to have found it impracticable to obtain an explicit opinion in favour of his system of agitation. (P. 29.) The Doctor thinks every odour which is exceedingly disagreeable to the bulk of mankind, is prejudicial to general health, and therefore ought to be abated. So far as applicable to the refuse of the Gas-works this opinion may perhaps be well founded. But, with due deference, the correctness of the general opinion expressed by Dr Traill is more than doubtful. Candle-works, soap-works, slaughter-houses, tan-works, and rotting dunghills, and land under top-dressing with dung, do all exist where no injury to health exists, although yielding no delightful odours. In the olden time, Edinburgh had a bad renown, not as unhealthy, but as offensive in relation to the matter under consideration, and the investigation already referred to concerning inhabitants long resident adjacent to the foul burn, even defiled as it has been by the Gas-works, leads to a refutation of Dr Traill's speculative notion. But, as already stated, why do the Commissioners of Police impute to irrigation that smell which proceeds from a different cause? Dr Traill ends his statement by expressing himself unfriendly to the irrigation, but that he cannot "denounce it as producing fever." He does not explain whether he had been made to believe like the rest, that he was writing about marshes. Had he been informed of the true nature of agricultural irrigation—against which the present agitation is directed—it is certain that his name would not have appeared in this Police pamphlet.

Next is Dr Andrew Combe, who is twice referred to. P. 29. (Pp. 29 and 92.) Dr Combe evidently relies on the averments furnished to him by the Police agitators. He takes it for

granted that the irrigated meadows are a *swamp*, a *marsh*, &c. and that butchers' meat cannot be kept sound twenty-four hours in their neighbourhood. Hence he concludes, that there must arise "general insalubrity" from such meadows.

Dr Combe is a gentleman of such delicate health, as obliged him to resign the very eminent situation of Physician to the King of the Netherlands or Belgium. He is evidently unacquainted with the nature of agricultural irrigation, and could not venture to test, by personal observation, the quality of what was represented to him as a swamp or marsh. Hence his opinion, like that of all the other doctors, resting on a false representation, is truly worth nothing, or rather, it is distinctly and explicitly erroneous, and ought to be reversed. Dr Combe in his second statement gives, as already mentioned, an account of the fact, that, in former times, the territory to the west of Edinburgh, while undrained, annually produced ague in the neighbourhood, which disease "has been banished from among us, chiefly by effective draining of the surface-soil." Here it seems evident, that, if Dr Combe had reasoned well upon his own facts, he ought to have inquired whether ague prevails annually now, or ever did, at Restalrig and Jock's Lodge? On obtaining an answer in the negative, he must have inferred that there was no marsh or swamp in the vicinity; and thus he might have been led to suspect the truth, or that agricultural irrigation is inconsistent with the existence of a marsh or swamp. But, had Dr Combe reasoned right, or had he possessed such vigorous health as to hazard a personal examination of the meadows, and the tenants of them, his name would not have adorned this Police pamphlet.

P. 30. Next, Mr Skae gives an opinion of the effect of "*stagnant pools and marshes*," and displays the same ignorance, by speaking of marshes produced by irrigation; and then he complains of the smell experienced by passengers along the Portobello road, knowing nothing of the cause of that smell, as resulting from the change in the direction of the road, combined with the establishment of the Gas-works.

P. 32. Dr Fyfe is next brought forward to state an opinion on

the effect of "foul stagnant water," thereby shewing utter ignorance of the state of the fact, that water cannot be allowed to stagnate for an instant on an irrigated meadow.

Then comes Dr D. B. Reid, Lecturer on Chemistry, un-P. 32. doubtedly an eminent and successful teacher of that branch of art or science, but to whom, and the rest of the doctors, the rule is applicable, "*Ne sutor*," &c. The opinion of Dr Reid writing about *stagnation* of water, the smell on a particular part of the Portobello road, and *hearsay* about periodical fever which never existed, is truly worth nothing, because founded on misrepresentation of the facts, or a want of knowledge of them.

On the statements of Dr D. B. Reid and Dr S. Alison Examination of Papers. of Tranent, Mr Tait, who has investigated the subject, remarks, that "fever is not confined to any particular locality in Edinburgh, with this exception, that it is generally most prevalent where the inhabitants are poorest; and, if one place be more exempt from it than another, it is the South Back of Canongate and St Ann's Yards, both in the immediate neighbourhood of the irrigated lands at the foot of Salisbury Crags. The facts which have come before us would also warrant us in protesting most firmly against this assertion, viz. that the smallness of the quantity of the effluvia or miasm dissolved by the air, is no objection to its influence. This, if true, would be in direct opposition to a general law of nature, that the effects of any chemical or physical agent is in direct proportion to its power, or its state of concentration. The effluvia of these lands, if prejudicial to health, must produce most effect upon those in nearest contact with them; and their effects must become less and less apparent, as the distance from the place of their origin increases, until they become totally inert. It is no argument in Dr Reid's favour, that he was one among others who suffered from inspiring some poisonous gas, mixed with a certain proportion of atmospheric air. Had it been combined with double the volume of air, it is probable that neither he nor any of the others would have experienced any bad effects from it. Because an individual may be poisoned by swallowing an ounce of laudanum, it does not

follow that one drop will produce any bad or deleterious effect. But between the highly poisonous gas to which he alludes, and the effluvia arising from the decomposition of animal and vegetable matter, there is no analogy. The one is known, from its uniform effects, to be hurtful to life when inspired ; the other has been shewn to be comparatively harmless. They are totally different in their nature, and as different in their effects. Dr Reid, however, goes on the supposition, that its effects on the constitution are so slow and gradual, that they do not for some time become apparent, but that it must tend to injure the health of the population ; he and Dr S. Alison of Tranent differing in opinion from the others (even from himself) on their side of the question, who contend that it is no argument against the insalubrity of these irrigated lands, that individuals long resident in their neighbourhood live long and enjoy good health, that they become inured to its effects, while strangers would suffer from its influence. Experience moreover tells us, that it does *not*, either in small or large quantities, produce any bad effect on the human body. There is no 'listlessness, languor, and debility,' no 'chronic inflammation and swelling of different internal organs, especially of the liver, spleen, and mesenteric glands, with the consequent diseases of partial or general dropsy, jaundice, loss of appetite, and gradual wasting away,' amongst the inhabitants on the banks of the 'Foul Burn.' They all appear to thrive well, to eat and sleep well, and take no little pride in boasting of the salubrity of their situation. Mr Oliver of Lochend keeps several men constantly employed, during several months in summer, in removing the sediment deposited in the tank on the Foul Burn ; and, so far as his knowledge extends, not one of them, although generally up to the knees in the mud for ten hours a-day, has suffered the least inconvenience from their filthy occupation. And for a specimen or picture of good health in ripe old age, we beg to refer Dr D. B. Reid to Alexander Lawson, who was employed in clearing the tanks and watering the meadows for a great part of his life, and retired from this employment only lately in consequence of old age, and not

from any chronic disease caused by the unhealthy nature of his vocation. The extracts from the records of the Burying-Ground at Restalrig, shewing the ages of those who had resided for a part of their lives in that village, and are interred there, will shew satisfactorily that Dr Reid is wrong in the opinion he has delivered." (P. 27.)

It may be added concerning Dr S. Alison of Tranent, P. 34. that he speculates loosely and falsely about the effect of irrigation, and talks of fearful diseases produced by the effect of supposed emanations from irrigated lands, of the nature of which irrigation he has evidently no knowledge, although, apparently from accident, he does not use like the rest the term *marsh* or *swamp*. The whole is a speculation about the benefits derived from a pure atmosphere, which unhappily does not exist in some of the houses of the poor of a great city.

Mr Liston, undoubtedly an eminent operator in surgery, P. 32. is here brought forward as an enemy to the irrigation in question. Some notice has already been taken of his statement about erysipelas. It is believed he was one of the persons most forward in attempting to excite clamour as an alarmist from apprehension of the cholera in 1831. It is rather thought that with more delicacy Mr Liston, who has removed to London, might now have held his peace, after the utter discomfiture of the prognostics made at that memorable period. He now talks of the irrigation as producing typhus, erysipelas, &c. His opinion on the subject is just as little trustworthy now, as many professional opinions given forth about the cholera of 1831. The opinion avowedly rests on the erroneous notion and averment that the irrigated meadows form a *swamp*. If they did so, all authority imports that they ought to produce not typhus or erysipelas, but ague or intermittent fever, and not profitable grass, that feeds thousands of cattle, but coarse marsh-plants, which cattle never consume. But the statement obtained from this gentleman is so extravagantly expressed, and so unlike the terms of a deliberate professional opinion by a man of science, that it obviously deserves no attention. It is given in utter ignorance of the nature

of agricultural irrigation, and rests substantially on a complaint that the new road passing diagonally across Lord Moray's meadows is exposed to the effect of the materials which proceed from the Gas-works.

P. 35. Dr Mackenzie is made to speak of the effect of malaria, as known from forty years' professional experience in three quarters of the globe. As all authors represent malaria as produced chiefly by marshes, it is plain Dr Mackenzie relies on the statement that the irrigated meadows are of that description, which is not true.

P. 35. Dr Huie talks of the meadows as *marshes, artificial marshes*, as producing malaria, which again produces intermittent fevers. (P. 35 and 36.) All this, however, is manifestly nothing to the purpose where agues are not found. Being aware of this, Dr Huie makes reference to two cases of fever which occurred at the Caledonian Dairy at Meadowbank, which, he says, resembled the acute fevers of warm climates, and this is all he has to say on the subject, which is evidently very irrelevant, as at all times, and in all situations, a single case or two of fever has occurred; but such solitary instances have not hitherto been ascribed to any other cause than the state of health of the individuals affected.

Examination
of Papers.

Accordingly Mr Tait remarked, "how any medical man, and more especially a talented and reflective man like Dr Huie, could at once, without a shadow of proof, save two cases of fever, declare any place unhealthy, appears to us altogether incomprehensible. Take every village, from Land's End to John O'Groat's, and it will be found that at one period or other it has been visited by epidemic fever, and that some of the cases have taken the very worst forms, perhaps even resembled the acute fevers of various countries. The very worst cases of typhus fever we ever witnessed occurred in a country village, in every respect favourably situated, in regard to soil and elevation, and the experience of every country practitioner could bear testimony to similar facts; and, if such is the case, we see no reason why the inhabitants of the Caledonian Dairy at Meadowbank should be exempt from it." (P. 13.)

P. 46. Passing over, in the mean time, the non-medical state-

ments, the letter by Dr Peebles to the Lord Advocate has been already noticed. Those by Sir George Ballingall and Dr Abercromby are opinions given without detail or reference to any other evidence than a letter by Dr Balfour, who relies on what he styles "marshy ground." That letter represents his father's family, resident in St John's Hill, as liable to annual attacks from intermittent fever, which are ascribed to marshes in the neighbourhood, but which neighbourhood is at the distance of miles from the meadows at and beyond Restalrig.

As it was certain that Dr Balfour was in error on the subject now mentioned, and consequently had misled the two other medical gentlemen, inquiry was made at his father on the subject, and there was obtained from him a verbal statement, which he consented to reduce into writing. On seeing the remarks in the Police pamphlet, he addressed the following letter to one of the gentlemen who had made very special inquiry on the subject. "You called upon me yesterday to inquire into the statement my son Dr Balfour gave, regarding the health of our family in St John's Hill. With regard to the general question whether an atmosphere, loaded with exhalations from putrescent animal and vegetable matter, can be inhaled with safety to the general health, I do not pretend to decide. We are certainly in the neighbourhood of such an atmosphere, and are occasionally annoyed by its offensive effluvia, and must be enveloped in it whenever the wind blows from that quarter. But since my name has been brought forward in the present controversy, what I have to do with is the facts of the case, and in order to prevent the possibility of misconception, or the risk of any misapprehension that might arise in a hurried personal interview, I think it necessary to send you the following formal statement.

Dec. 10.
1839.

"My son, Dr B., states, and states truly, that we were subject for some years after we came to St John's Hill, especially in the prevalence of easterly winds, to fevers of a remittent character, which required and yielded only to the exhibition of bark. My son did not previously communicate to me the evidence he had given. He spoke from

his own distinct recollection of the facts ; but I must admit in fairness, what I yesterday stated to you, and what he was too young at that time to recollect, that we brought this disposition to remittent fever along with us to St John's Hill ; for in Gilmore Place, we had the same type of fever, and, indeed, had there a regular tertian, which I attributed to the miasmata which reached us from the meadows' (*i. e.* Bruntsfield Links), ' at that time imperfectly drained, and contaminated also with the contents of the common sewers of George Square and the neighbourhood. After our family had passed the period of childhood, the recurrence of these attacks ceased ; and however our senses may be occasionally assailed by the smell, our general health, so far as I can discover, has not been since then visibly affected by it. Whether this arises from the innocuous nature of the exhalation, or from our getting *all hardened* like the nurses in a fever hospital, is a question I leave to the decision of others. I confine myself to the facts of the case.—I am, &c."

(Signed)

" ANDW. BALFOUR."

This letter requires no commentary, and it is plain that the first part of Dr Balfour's letter is the result of want of recollection. The next statement in Dr Balfour's letter, however, is, that from December 1838 to 22d January 1839, he had attended between 90 and 100 sick in St John's Hill district, and of these, between 30 and 40 were fever.

No intermittent cases are here mentioned ; but, taking the sick and fever cases as here given, and, like Dr Abercromby, placing " great confidence" in Dr Balfour's statements, without supposing his youthful inexperience may here also have misled him, what does it amount to ? That in a district densely peopled with the poorer classes, there was sickness and fever in the depth of winter. As this is not more than occurred in other parts of Edinburgh and in Glasgow, or other populous cities, it is evidently no impeachment of the salubrity of St John's Hill.

P. 49. As to the garbled statements of evidence taken in the action at the instance of Mr Duncan and others, which ended in 1809, any farther remarks seem unnecessary.

The proof led by the defenders in that action, refutes the pretext of the Police Committee.

But the agitators attempt to alarm the public by large quotations from the Report of the Poor-Law Commissioners of England about the causes of fever, in which there is much said about want of sewers and drains,—uncovered stagnant drains and ditches,—stagnant pools and undrained marsh-land,—the situation of slaughter-houses, &c. The reference might have been extended to various English towns, such as Leeds and Liverpool, &c., in parts of which these nuisances abound. But the question is, What concern has all this with the temporary increase of fever in Edinburgh, where there are no stagnant pools or ditches or undrained marsh-land, but a rapid stream descending from a high territory? All that is said about certain miserable and filthy situations in the vicinity of London, where there is bad ventilation, much poverty, much defilement, and no rapid stream to carry off the pollution, may be true; but, so far at least as general ventilation is concerned, these remarks have no bearing on the character of our northern metropolis, situated aloft, and exposed to abundance of ventilation by the winds from the sea and the mountains.

The last of the medical statements is that of Professor Christison, with whom Dr Hunter, in brief terms, says merely, that he concurs. The professor is town-born and town-bred. He proceeds on the supposed existence of *marshes* and a *bog*, and presumes that these, which are held synonymous with irrigation, demand inquiry. The professor declares his opinion to rest on three averments, “if well established:” 1st, That the dairy produce of cows, fed on the meadow grass, is bad; 2^d, That wounds received by persons employed on the meadows are apt to be followed “by inflammation and gangrene;” and, 3^d, That unusual sickness and mortality prevail at Piershill Barracks. As none of these averments can be established, but, on the contrary, are distinctly unfounded, the opinion given by Professor Christison, and adhered to by Dr Hunter, falls to the ground, or, in truth, ought to be reversed, and overturns the whole pretexts of this Police Committee.

Besides the statements mendicated from medical gentlemen, or compiled from anonymous paragraphs or letters in newspapers, &c., the Police Committee have been pleased to bring forward what they style "Miscellaneous Evidence," that is to say, statements collected from all and sundry agitators and others, whether entitled or not entitled to public confidence.

One of the most zealous of these agitators seems to be Mr Rankine, the manager of the Leith Branch of the Edinburgh and Dalkeith Railway. Mr Rankine was in that character the antagonist of Mr Miller in 1834, when the Railway Company insisted on obtaining for their railway a passage across the broadest part of Mr Miller's irrigated fields; and, when a jury not only awarded in his favour the price of the land occupied, but a sum of L.2000, because their railway prevents him from increasing by irrigation, if he should think fit to employ it, a field of about eight acres, employed in ordinary agriculture.* Mr Rankine seems ever since to have retained a groundless spirit of hostility against the interest of Mr Miller. (P. 53.) Mr Rankine (P. 62.) now says, that the railway passengers dislike the smell of the meadows. The answer is, Why did the Company insist on crossing them at their greatest breadth? The Gasworks then existed, and caused the smell so far as it reaches the vicinity of the sea. Mr Rankine talks of a walk taken by himself through the meadows twice or thrice a week, which gave him headach and sore throat, and says the workmen became sallow and yellow coloured. (P. 54.) As the workmen are not named, the correctness of the statement is protected against investigation. But Mr Rankine's own countenance exhibits no such appearance. As to the effect of his walks along the meadows, it is sufficient to say, that the line of railway is so near to the sea, that, about two years ago, in a spring-tide, the sea broke in and damaged considerably a part of the works. Mr Rankine, walking

* The verdict of the Jury, in so far as it awarded damages on the point now alluded to, is in these terms: "13th August 1833.—The Jury before named," &c., "Find, That the damages due to Mr Miller on the triangular field, No. 13 on the Plan, from its not being in his power to irrigate it in consequence of the Railway, are L.2000.

or standing for an hour occasionally on the shore in an east wind, might very readily get a sore throat, whether the ground to the westward was irrigated or not. Let him rejoice that he did not get a scarlet fever as others did from loitering in an east wind upon that exposed beach, long before the railway existed, or the irrigation had been extended to the sea-shore.

But Mr Rankine has told about a man, said to have been unhealthy when resident during a year at Seafeld Toll-bar, which is at the extremity of the irrigated ground towards Leith, and close to the sea-shore. (P. 57.) Inquiry has been made at the person referred to how the fact stands, and it is creditable to him that he readily made answer. He was keeper of Seafeld Toll-bar, from Whitsunday 1837 to Whitsunday 1838. His wife was with him there, and his children aged the one a year and a half, and the other five years. He was frequently troubled with stomach complaints, which he ascribed to the necessity of rising out of his bed in the night to open the Toll-bar to travellers. His wife did not enjoy the best health, but his children were perfectly healthy. He had previously kept a Toll-bar at Dalkeith, and was there also troubled with stomach complaints. He has had none of these complaints, when otherwise employed than in keeping a toll, that is to say, when permitted to enjoy sound sleep like other labourers.

It may be added, that other persons residing adjacent to Seafeld have enjoyed perfect health, and even that Michael Pentland when he went to be keeper of Seafeld Toll-bar in 1834 was unwell, but after a short residence there, became perfectly well, and continued so. Walter Eckford also enjoyed good health when he kept Seafeld Toll-bar in 1838. The genteel families resident in that neighbourhood, called Pirniefield, never experienced bad health from the vicinity of the meadows.

Dr Johnson's essay on malaria and marshy situations which produce ague requires no remark in this case in which ague does not exist. (P. 54.)

Mr Glas of Marionville, a non-medical person, is twice P. 54-62.

brought forward ; first to say, that wounds received by persons employed in the meadows terminate in gangrene ; and secondly, to tell that no horse or animal of any kind will eat a particle of the produce, and when brought to eat it, their milk is bad, and they become completely diseased. It is sufficient to say, that the statement of Mr Glas may be safely passed over without commentary, as overturned by evidence, and by the fact that the irrigated meadows do produce profit to their owners.

Passing over the statement about Piershill as sufficiently refuted, and about some unknown ladies and gentlemen at Comely Green or elsewhere, Mr Millar, a surgeon, is made
 P. 57. to say, that some family not named, were affected with boils, when the *floodgates* were opened. This inflated and metaphorical statement evidently has no bearing on the question, on which the pamphlet rests, viz. whether the irrigated meadows are truly *marshes*.

P. 58. Some unknown physician in town, but whose name the Police Committee are debarred from publishing, is next made to say, that somebody in St John Street, and two ladies in the Palace, had fever ; that the former had the type, or what is occasionally produced by marsh miasmata ; and that some unknown family farther south, complained of smell from meadows, which they supposed imperfectly drained. It is obvious that such anonymous statements are not capable either of admission or refutation. If the officers of Government are to be so instructed, their opinion or report will be of little value.

Mr Miller of King's Park says, his very *door plate* is affected by the bad smell, and ascribes two cases of fever to the same influence. (P. 56 & 58.)

P. 58. The Rev. Dr Lee is next brought forward to say, that he inhabited Milton House seven years, but thought that some irrigation recently commenced was unfavourable to the health of his family,—that they suffered from malignant fever, and he himself had dysentery. The fever is not said to have been intermittent, which it ought to have been if produced by the cause to which it is ascribed by Dr Lee. The *recent* irrigation referred to is not that of the Earl of Had-

dington's grounds. It is said that irrigation has recently been attempted on a small field belonging to Fletcher of Saltoun. But inquiry has been made at the Roman Catholic Nunnery, in the same residence that Dr Lee thought unhealthy, and at other inhabitants of the neighbourhood. The whole are healthy, and that fact can be established by competent legal evidence, an inquiry on the subject having been made. The locality is far distant from the irrigated lands.

Dr Lee's letter speaks vaguely of the King's Park as a place in which there is an "accumulation of nuisances." This is unintelligible. The King's Park includes the hills of Arthur Seat, occupied as a sheep walk. If by the term is meant St Ann's Yards only, being the ground contiguous to the Palace, it is sufficient to say, as already noticed, that the drain there has from time immemorial been fully covered.

It is next said, and Dr Mackenzie is brought forward P. 59. as voucher, that the "marshes and tanks" produce in east winds an offensive smell on Calton Hill. The answer again made is, Demolish the Gas-works, or enforce the law against them. But the whole statement is regarded as an exaggeration by a nervous person. The foul burn in its natural state never did, and never will, produce any smell, good or bad, on the Calton Hill. (P. 60.)

Messrs Hamilton, Miller of King's Park, and Gavin, next P. 47, 48,
49. furnish three long letters, vehemently vituperating the vicinity of the Palace. The first letter signed "Ja. Hamilton of Kaimes," states that he has lived nearly a quarter of a century in the Palace,—that when he first resided there the nuisance was comparatively inconsiderable, but that nauseous streams have been thrown over an immense tract of country, so that not a wind blows but carries pestilence against the Palace—that the lanes and avenues around are proverbially pestilential, and the "modern Athens will soon become the city of the plague." (P. 48.)

Truly when a man tries to excite or help forward a popular agitation, he should try to preserve some portion of his own wits. Mr Hamilton is a writer to the Signet who

daily frequents the Courts of Law during their Sessions. That he might take the benefit resulting from the exercise of walking two or three miles from the Palace to the Courts and the Register House, on all affairs of business, and might disregard personal hazard, may be true; but the question is, how does Mr Hamilton account for his conduct in causing his lady and her children to reside amidst pestilence, and all the nauseous winds and vapours that he represents as so fearfully directed against this unhappy royal palace. In reality, however, the whole is a piece of eloquent folly, or inflated rhetoric, and Mr Hamilton is not the unprincipled husband and father that he is here represented. No increase of the irrigated meadows has been made, except next the sea, at the distance of three miles, nearly twenty years ago, and another addition nearly two miles from the Palace. Instead of increase, a diminution has occurred of the meadow ground to the extent of the area of the new London Road, upon the Earl of Moray's meadow ground, and as to pestilence, it is a mere imagination, a fact ascertained by strict inquiry as already stated, and even proved by the perfect safety and firm health of Mr Hamilton's family.

P. 48. Mr Millar, if not so eloquent is equally violent, and, like the other agitators, speaks of a marsh where no marsh exists. The letter amounts generally to a complaint that near the foul burn the smell has much increased "of late years," and thirty years' residence enables him to judge of the "tremendous increase of the evils complained of." This is no great discovery. The Gas-works were erected about twenty-five years ago, and hence the increase, this being within the "thirty years' experience" of this gentleman.

It is added by Mr Millar, that Comely gardens are no longer frequented. It is answered, that neither is the Canongate, because by a change of fashion the New Town has been built

P. 49. Next is a letter by Hector Gavin. Mr Gavin's statement is, that in his remembrance there were no ponds in St Ann's grounds, but Mr Gavin is in the prime of life,

and can be contradicted by witnesses, whose testimony includes a considerable proportion of the eighteenth century, and long before Mr Gavin was born. The ponds reached Gowan's marble-work, and Brown's coach-yard, now Mr Simpson's, at the foot of the Calton Hill, opposite Carlton Terrace. These ponds are now removed.

He next states, that the grounds have become such as to drive away every respectable person; that Mrs Gavin declares that she cannot keep her health—her sickness is dreadful. Now this, too, is contradicted by fact; for in place of persons being driven from this locality, what is the fact? Why, first, there is Bailie Nicholson, a most sensible man, and (what is more to the point in this matter) the very picture of health. He lived, as formerly remarked, four years, not at St Ann's Grounds, but much nearer the burn, viz. at Clockmill Bridge, and there feued the stance of ground next to it, and built a splendid villa, with offices, after the form of the Newington villas, and here he and his family dwell, not driven away from the place. Next to Bailie Nicolson is the beautiful sequestered house possessed by Mr Peat, of the Customs, Leith. Next to it is the handsome villa entering from Rose Lane, with garden, &c. possessed by Mr Mein; then Mrs Baron Norton's Mansion-house, with garden and shrubberies; and then the mansion house of the late Mr Plenderleath, now occupied by Bailie Arnott. Mrs Norton has lived there all her life; and all the other individuals, in place of being driven away from the neighbourhood, have come to it within the last ten years or less. So that Mr or Mrs Gavin need be under no apprehension on this point.

The statement of Mr Gavin concludes with a description of his house "antique," once Regent Murray's, and "the abode of nobles," the garden and servitude; and a threat of what these grand places will become when Mr Gavin comes to feu them (which, if he cannot get the meadows removed, he is to do), for buildings having steam-engines, chimneys, &c. &c. all close to the Palace! Mr Hamilton of Kames, and Mr Millar of King's Park, may if they please be appalled by these threats, but Mr Gavin must, like others, submit to destiny. Places once

as much in request, have in our times been desecrated by steam-engines and chimneys for engines. Look to the New Town itself, where the steam-engine and chimneys for plumbers, blacksmiths, &c. have made their appearance.

The secret is, Mr Miller's family, Mr Gavin, and some others, have heritable property, like Mr Balfour, at St John's Hill, in localities now become unfashionable; they think if they could get the foul burn removed from its ancient course somewhere else, this might pave the way for a sale. These parties have, however, committed a blunder. They have unwisely proclaimed to the world that these localities are uninhabitable. How far this is a profitable course, with a view to the market price of their properties, they are left to judge.

P. 37. Next is a certificate by Mr Sime, the Governor of the House of Refuge, formerly Queensberry House. If fever come to this house, it is surely no miracle. The inmates are those destitute of house and home, of clothes, and of food, and who may happen to have no claim on any other institution. In all their filth and wretchedness, they find an asylum here, temporary merely, to prevent them from dying on the street, till they can be disposed of in some other way. That the house and its locality should be blamed for this, seems most absurd, when so many clear and palpable causes, from the state of the persons themselves, are to be seen. But, observe, it is the House-Governor's certificate. Where is the certificate of Dr Fairbairn, the surgeon of the Institution?

A special investigation has been made, and it is certain that the district is, what it has always been, perfectly healthy, although now inhabited by a population more numerous and different in rank and name from that which once inhabited this formerly the court and fashionable end of the city, when Edinburgh was liable to a degree of defilement in its streets and lanes which has of late been much rectified. But, as formerly noticed, if the foul burn be offensive in this neighbourhood, why did the Commissioners of Police fail to do their duty with regard to the Gas-works?

Before closing this part of the case, notice must be taken

of a quotation from what is said to be a valuable treatise on the Draining of Land, by Mr Johnstone. (P. 64.) It is alleged that, in his treatise, he says, concerning the irrigated meadows, that “though this species of irrigation adds to the *rental* of the owners, it contributes *nothing to the health* of those who live near it. In the summer months the malaria is almost insufferable. Part of these meadows lie within a few hundred yards of the royal palace and the horse-barracks.

“The cholera of 1832 was more prevalent in the district adjoining these *mires* than in other localities. Milk-cows are chiefly fed with the product of these fields, which must affect the flavour of that most useful fluid, as much as it does the salubrity of the air.”

It may be that Mr Johnstone knows and teaches how to drain land, but before making a book on an art, it were well that the intended author should learn how far it is practised, and what are the objects to which it is applied. Evidently Mr Johnstone has made no inquiry concerning the practice of irrigation in Lombardy or elsewhere. He is unacquainted with agriculture, else he would be aware of the application of his art to one of its finest improvements, that of irrigation, and that irrigated meadows never can be liable to be described as *mires*. Farther, some inquiry might be useful to an author, in order to avoid false insinuations about the health of the inhabitants of the neighbourhood of irrigated grounds, such as in the case of Restalrig, and the unfounded assertion about the cholera of 1832. In a word, by this unlucky quotation or reference, Mr Drysdale has done no good to the reputation of Mr Johnstone as an author on draining land.

Observe with what a different spirit an intelligent agriculturist expresses himself on the same subject, in a treatise written by him upon draining (The Practical Irrigator or Drainer, by George Stephens, p. 76). After mentioning the different irrigated meadows of Scotland, and the meadows in question, in particular, he adverts to those of Mr Miller, saying, “In the spring of 1821, thirty acres of waste land, called the Freegate Whins, and ten acres of poor

sandy soil were levelled and formed into irrigated meadow, at an expense of L.1000. The pasture of the whole of the Freegate Whins was let previously to this improvement for L.40 per annum, and the ten acres for L.60. They now bring from L.15 to L.20 per acre per annum, but may be much improved by judiciously laying out L.200 more in better levelling that part next the sea, and carrying a larger supply of water to it, which might be easily done without prejudice to the other meadows.

“ This, perhaps, is one of the most beneficial agricultural improvements ever undertaken ; for the whole of the Freegate Whins is composed of nothing but sand, deposited from time to time by the action of the waves of the sea. Never was L.1000 more happily spent in agriculture ; it not only required a common sewer to bring about this great change, but a resolution in the proprietor to launch out his capital on an experiment upon a soil of such a nature.”

Much is said in the pamphlet about danger to health, resulting from animal substances in a state of putrefaction, but as none such exist on the irrigated meadows, and it is in facts, and not in speculations, that the owners of these meadows have an interest, that speculative subject will not here be discussed. If all that is said in the pamphlet were true, it is clear that Paris, with its multitudes of dissecting-rooms, and Edinburgh, with the same establishments on a lesser scale, might create apprehension of danger which does not in reality exist. The top-dressing of lands in England, and the accumulation of manure near farm-houses in Scotland, would be sources of pestilence. The agitators complain of their pleasure-walks being abridged, by the meadows, referring merely to the New London Road ; but why do they tolerate dunghills adjacent to every high-road around Edinburgh ? Nay, will it be believed, that the Commissioners of Police themselves are chargeable to a most flagrant extent with perpetrating the very acts falsely ascribed to the proprietors of the irrigated meadow lands ? For it is a fact which will not and cannot be denied, that the Commissioners accumulate into vast

heaps, at the south and west parts of the City, the whole manure and refuse carted from the streets and houses of the City, and excrementitious matters from the public necessities, and form these heaps into dunghills in a fermenting state, technically called "the pye", which are to be found throughout the whole year. These dunghills cover nearly some acres of ground, and it is very difficult to say whether their obnoxious effluvia, or utter inutility in point of profit, is most conspicuous. Independent of the conduct of the Board of Police in that respect, did they venture to complain, in autumn 1838, when the road to Granton, and a considerable part of the road from Leith to Queensferry, were for a time rendered utterly impassable, by the deposit and spread of some singularly nauseous description of manure? Yet from the roads now mentioned, and walking or riding tracts, the most beautiful views are obtained of the city, and its castle, and hills, and towers, on the one side, and the Forth and its shores on the other. By a law which the Edinburgh Board of Police did not make and cannot control, every new race of plants and animals is produced by corruption proceeding from that which has gone before it.

It is confidently believed, and even trusted, that these wild agitators never contemplated the effect of their demands, if successful, or the consequences to which their success would lead. In charity it must be presumed, that Mr Drysdale never thought seriously on the subject on which, in simplicity of heart, he has allowed himself to be put forward to give aid towards exciting a popular agitation.

Let it be supposed that the irrigation of the meadows in question should be prohibited by any competent and effective authority, the effect has been already adverted to, but the question may fairly be once more put, what would follow?

1. Above 400 persons daily occupied during the season upon these meadows, besides servants, three times that number occupied at home, would lose their employment,

and be thrown upon the market of labour and of business already overstocked in Edinburgh.

2. The lands around Edinburgh, and on the line of the Union Canal, would be deprived of the dung of three thousand stall-fed cattle. By that manure these lands are enriched, the tenantry are enabled to prosper and to pay considerable rents, and they and the proprietors are enabled to make a large expenditure among the shopkeepers of Edinburgh and Leith.

3. The sale annually to the town cowfeeders of 3000 milch-cows, reared by farmers at a moderate distance from Edinburgh, would terminate, with all the profit derived from these sales by these cattle-breeding farmers.

4. The supply of butcher-meat in the markets of Edinburgh, Leith, and the neighbourhood, would suffer grievously, by withdrawing the annual sale and slaughter of nearly 3000 stall-fed cattle, chiefly grass beef.

5. The immense quantity of dairy produce obtained from 3000 milch cows would be withdrawn, to the effect of throwing the city on resources derived from the upland and remoter farms, to the effect of enormously augmenting the price of that commodity, in a city too heavily taxed already.

6. The poor's rates of the town of South Leith must be severely increased, if the rental derived from irrigation is to be withdrawn. The town of Leith, as a sea-port, becomes the residence of many widows and orphans, in consequence of the fatal hazards incident to navigation, and the poor-rates there are nearly double the proportion of those of Edinburgh. But this subject, of the interest of Leith, deserves farther consideration.

The natural drain of the northern and south-western part of Edinburgh is the Water of Leith, which passes into the harbour of that town. The effect of the drains actually existing is, that much expense is incurred in constantly removing from the harbour the deposit made there. Let the irrigation be prohibited of the forty or fifty acres on the west of Edinburgh. These at present purify the descending stream, and send it into the Water of Leith so purified as to be in-

capable of yielding the slightest deposit; but hereafter the foul stream will be sent down loaded with all its impurities, to be deposited in the harbour of Leith, and to give more full work to the engine employed to drag the mud from that harbour.

One of the projects of the agitators, both of 1832 and 1839, concerning the easter foul burn, has been, to make a *tunnel* across the Abbeyhill, and by that tunnel to transfer the whole of the foul burn into the sewer or drain of Brunton Place, and thereby to convey it to the Water of Leith. Supposing the plan practicable, and adopted, the effect would be to deliver the whole of the eastern foul burn, with all its impurities (independent of the fragrance of the Edinburgh Gas-works), into the harbour of Leith. Truly the inhabitants of that town and their harbour would be brought into a delightful condition. If the smell be half as bad as it is described by the agitators in their pamphlet, no foreign vessel would be disposed to approach them.

No doubt it has been said, that, instead of proceeding from Brunton Place to the Water of Leith, the foul burn might be led round to the sea to the northward of Seafield Toll. In other words, it might be poured upon the sands of Leith with all its impurities. The amenity of Leith and of its best buildings is to be entirely sacrificed by a grant of the benefit of that foul burn, which it is pretended the neighbours of the Clockmill Bridge cannot endure.

A different project has indeed been suggested, viz. to cover in the foul burn by an arch to proceed by Clockmill to the sea, or from the Watergate at the foot of the Canongate to the sea. To afford a glimpse of the expense of such an operation, it may be observed, that such a covered drain was made some years ago from the Earthen Mound on the west, to the Watergate on the east. Certain public bodies contributed about L.4000, but still the operation cost the neighbouring proprietors about $12\frac{1}{2}$ per cent. upon their rental for some years. If the stream now mentioned, which is only one of the feeders of the eastern foul burn, cost such sums to cover it in, it becomes a fair question, Has any person calculated the cost of making an

arch of two or three miles in length to cover the burn itself? The arch must be of capacity to contain the stream at the highest floods. They who remember what torrents of rain have at times suddenly fallen in Edinburgh, and have witnessed the velocity of the descending current, well know what this means. If an arch not sufficiently large be formed, the whole will be blown up, and the neighbourhood drowned by the flood. Even at present, nearly the whole of the territory of Craigentenny has sometimes been suddenly laid under water. In forming a covered channel, a sum of L.60,000 would speedily be consumed. But another subject of consideration, connected with the important matter of expense, remains, viz. the legal right of the proprietors of the irrigated meadows. That professional question is not meant to be argued or considered here, but it is a well-known principle in the law of Scotland, and known to high and low, that where a stream passes through the property of two or more individuals, the proprietors on the upper part of the stream, who are called in the law of Scotland the "superior heritors," are not entitled to divert or use the water in its passage through their lands so as to deprive the proprietors on the lower parts, who are called the "lower heritors," of the full use and free enjoyment of the stream. From time immemorial the defilements of Edinburgh have passed eastward by the foul burn, and the proprietors would now in vain attempt to resist that usage whereby the contents of the common sewers have become part of the stream. To the full use of that stream, such as Edinburgh has made it, the lower heritors have a right. With what countenance could the Police Board of Edinburgh say to the Earl of Moray, "True, you have a right to the stream that naturally descends from the higher grounds to your lands; but because we have defiled the stream, you must not use it in agricultural irrigation, as you might profitably have done if we had not made it impure. Such reasoning would evidently be held too absurd to be used, or if used, to be regarded otherwise than with contempt. Farther, the same principles appear applicable to the western as well as to the eastern mea-

dows. It is certain that the clauses in the different Police acts conferred nothing upon the proprietors of the irrigated meadows which they would not have obtained from the Courts of Law. The import of the case of *Russell v. Haig* has already been noticed. The case of *Duncan v. the Earl of Moray* and others, clearly fixed the question of legal right, and it is known that a judge and jury held Mr Millar of Craigentenny entitled to full compensation for the damage done to his irrigated meadows by the formation of the railway from Dalkeith to Leith.* If the ancient effect of the foul burn has been altered by the Gas-works, or by the alteration of the highway eastward, these are matters which cannot affect the legal right of the proprietors of the meadow-ground.

But every thing has its price ; let the foul burns be poured, with all their impurities, into the water and harbour of Leith, or let the eastern foul burn be conveyed under a tunnel to the sea, the agitators, in the full disregard of law and justice, seem to suppose, that, by a public bill being brought into Parliament, the proprietors of the irrigated lands may be plundered or deprived of their property without compensation. In that respect they will be grievously disappointed, and will find that they have been grossly ignorant of the principles and the practice of British legislation. It is clear that the British Parliament will never deprive these proprietors of their legal rights without affording them indemnity. To these proprietors the profit derived from the foul burn is annually augmenting, and therefore it evidently would not be withdrawn from the eastern proprietors for less than L.150,000, or from those in the west without a proportional indemnity. Were the money paid down to the proprietors, and the irrigation withdrawn, it must be clear to every man of sense, that a misfortune instead of a benefit would be thereby purchased and procured to the City of Edinburgh and the neighbouring territory. The Chairman of the Police Commission has said in his note, " The inhabitants of the city, it is believed, would be ready to submit to additional burdens in

† Supra, p. 48.—Foot Note for Verdict.

order to carry so important a measure as this." This suggestion is utterly unfounded. On a memorable occasion the inhabitants were gulled by a set of interested jobbers as to what was called an Improvement Act, and bitterly do the community now feel and regret these proceedings. They are now influenced by salutary jealousy of such agitators. The expense even of printing this Police Committee's pamphlet formed matter of discussion at the Police Board, and it was proposed to apply to the Burgh of Canongate, and the Southern Districts, to bear a share of it. But aware that these bodies (how vehemently soever they might declaim against the irrigation at their public meetings), would refuse to pay any part of the expense, they were not applied to. The Police Board was induced, after considerable discussion, to agree to pay the expense exclusively to protect against personal liability the Chairman of their Committee, who had somewhat rashly employed the printer.

In truth, this, like most other popular agitations, would never have existed but for the inconsiderate rashness of a leader, flattered by an appearance of popularity, derived from the exertions of a few interested individuals, of whom he has become the unconscious tool. Look to those who took an active interest in urging the present agitation at the Police Board or at the Canongate Meeting, or in the most virulent and clamorous of the published letters. Every one of these persons, more or less directly by themselves and their connections, have, since 1832, kept agitating the community, in the hope of amending, as they suppose, their private patrimonial interests, ascribing the unfashionable situation of their property not to its true cause, the construction of the New Town, but to circumstances which either have existed for ages, or with which the owners of the irrigated lands have no concern, and which they did not originate. The proprietors of the irrigated meadows must, of necessity, defend their property and legal rights, and it is hoped that the inhabitants of Edinburgh will not allow a set of foolish and reckless, or selfish and ignorant, agitators to involve them in expense, in order to effect the

most gross injustice, and to do mischief to the community of Edinburgh, to the town of Leith, and to the whole of the neighbouring country.

New Pamphlet.

Before concluding, it may be proper to remark that an anonymous publication or pamphlet has just appeared in support of the views of the same agitators.* Some attempt is made to give it a colour as an original treatise, by adverting to other circumstances; but the principal part of it is evidently framed as a mere abridgment of the publication of the Police Committee. It has obviously been prepared and published, in order to recall to the subject the attention of the public of Edinburgh, and, if possible, to revive the exhausted spirit of agitation.

If nothing more had been meant on the part of the promoters of the agitation, than honestly to state what they truly regard as facts, and to bring forward the results of a careful investigation of proceedings accounted as of public importance, here was an opportunity of correcting the errors or misstatements that might have found their way into the original publication, so that the question at issue might now be discussed with fairness and candour. But nothing of this description has been attempted. On the contrary, all the former falsehoods, blunders, errors, and absurdities are persisted in and repeated, without even a semblance of novelty, or a pretence of more correct investigation. Hence it appears altogether unnecessary to commence a serious refutation of this very foolish, and even absurd publication. The statements in it have, it is hoped, been completely defeated by the refutation already given of the original publication, from which the new abridgment is framed.

Had the agitators possessed, if not honesty, at least common sense or prudence, they would at any rate have taken the opportunity of correcting their former absurd aver-

* "A Brief Narrative of the Commencement and Progress of the Fetid Irrigations and Foul-water Pits around the City of Edinburgh, with proof of their operations in creating nuisance, and in producing disease."

ments about the extent of the irrigated lands. At least, the former absurdity of representing 200 acres as amounting to 2000,—the public would not have been told of 2000 acres of irrigation. The agitators would not have represented the west meadows of 40 or 50 acres, as amounting to “two miles in length by one in breadth,” or, in other words, as extending to 1296 acres; or the east meadows of less than 200 acres, as being “two miles long by half a mile broad,” or, in other words, as amounting to 648 acres, being in all within a small fraction of the old absurdity of 2000.

The irrigated lands are still obstinately represented as *marshes*, and the process of agricultural irrigation as necessarily converting land into a pestilential marsh. The valuable art of agricultural irrigation is still absurdly described, on the authority of an inspector of Police, instead of recourse being had to writers on agriculture. Mr Johnston’s absurdity about malaria is repeated, and the foolish statement of Mr Glas, that no animal will eat the grass that grows on the irrigated meadows, or, if they eat, they speedily die. All the refuted errors of Dr Simpson about Piershill Barracks are stated anew, and anonymous stories given afresh about families not named who have suffered from the irrigation. The condition of the Palace of Holyrood is misrepresented as formerly. The import of Mr Duncan’s action, and of the recorded decree, are misrepresented as formerly; and, hence, it is not surprising that again and again agricultural irrigation is described as creating a putrid marsh, productive of pestilential effluvia. All the exaggeration of Messrs Miller, Hamilton, and Gavin are repeated, and the health of those employed on the meadows is, with utter recklessness, represented as suffering from an employment which they themselves find salutary. Even Dr Balfour’s statement, which had been admitted to be erroneous, is once more brought forward in this very strange treatise.

In short, there is nothing in this most absurd pamphlet that requires farther notice. The whole statements in it have been confuted by anticipation; or rather, they amoun

to a mere repetition of all the falsehoods contained in the Police Committee's pamphlet, the refutation of which disposes of this renewal or abridgment.

A very singular circumstance, however, cannot be passed over, which is this, that neither in the Police Committee's pamphlet, nor in the present renewed statement of its contents, is there a single statement or remark concerning the *Edinburgh Gas-works*. From the perusal of one or both of these publications, a stranger would never discover, or even be led to suspect, that an establishment for the manufacture of coal-gas existed in Edinburgh. Assuredly, he would not be informed of its existence by any statements in the pamphlets in question. How has this happened, in a case in which complaints so loud and incessant are made about nauseous and offensive exhalations? Every human being in Edinburgh, and in most other cities and towns, is aware, from experience, that gas, even in its highest purity, indicates its presence by a most offensive smell, and that every sort of refuse proceeding from such works is utterly offensive. Did it not once occur to this Committee of Police or the agitators, that the offensive exhalations might have some connection with the Gas-works? did they fear to offend the shareholders? or were they indeed destitute of the spirit necessary to enable them to speak out upon the subject? or to do their duty to the public by restraining the operations of these works as authorized by statute? It is for them to explain how the fact stands; but it is strongly suspected that the public will form their own inference, without waiting for any explanation on the subject. At public meetings, and in particular, at the meeting of the Southern Districts, individuals not in the secret are believed to have explicitly accused the gas; but all such remarks were carefully withheld from the published statements. Had the effect of the Gas-works been stated, all the beautiful eloquence and useful exaggerations about damage to the Royal Palace, and the mansions on the Calton Hill, must have been lost; to the great detriment of the agitation.

As already stated, to afford some pretext for the recent

publication, a story is told about a nuisance in Liverpool, produced apparently by the waste of more muriatic acid than would have sufficed to fill the world with a principal material of sal-ammoniac, or, with the usual accompaniment (black oxide of manganese), to bleach almost all the linen manufactured in Ireland, and Scotland to boot. An idle project is also introduced, about making a reservoir to fill the Water of Leith with a more copious and constant stream; but as such matters have no concern with the present question, and have no tendency to improve the discussion of it, they require no special notice.

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